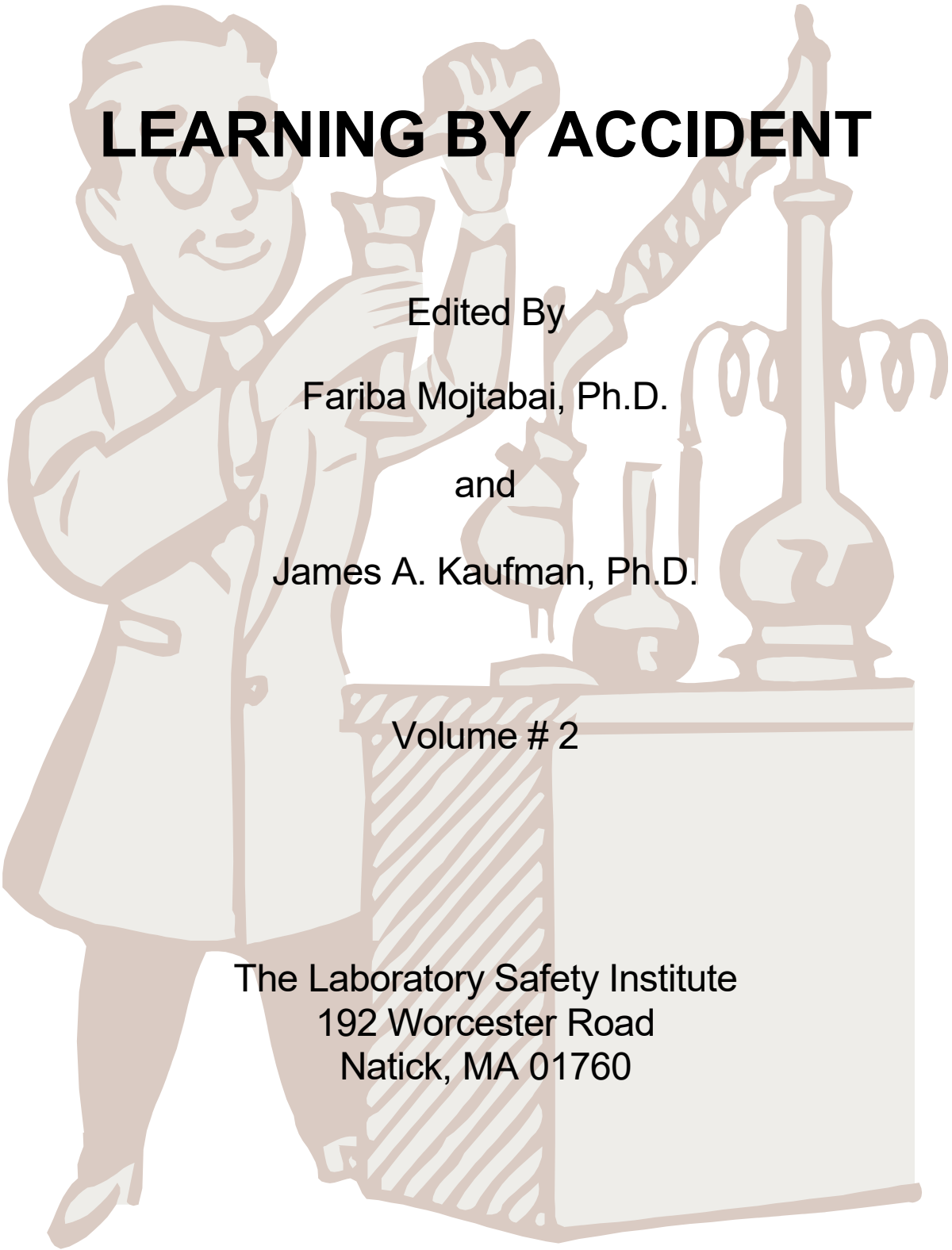

LEARNING BY ACCIDENT

Edited By

Fariba Mojtabai, Ph.D.

and

James A. Kaufman, Ph.D.

Volume # 2

The Laboratory Safety Institute
192 Worcester Road
Natick, MA 01760

The Laboratory Safety Institute
192 Worcester Road, Natick, MA 01760
508-647-1900 Fax: 508-647-0062
Website: http://www.labsafety.org
Email: info@labsafety.org

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

We wish to thank the many science teachers who contributed the anecdotes, stories, newspaper articles, and accident reports that are the heart of this book. Thanks to Barbara Jerome for her help with the manuscript typing. And, thanks to Don Dix for introducing me (JAK) to the importance of laboratory safety.

INTRODUCTION

Since the founding of the Laboratory Safety Institute in 1978 as the Laboratory Safety Workshop, I've been involved in offering lab safety training programs for science teachers. One of our activities during these training programs is the sharing of accident experiences. Teachers spend a few minutes writing an accident summary and then describe and discuss these accidents with each other.

Several things invariably happen. Teachers are amazed by both the number and seriousness of the accidents. Many teachers have had similar experiences. Teachers realize that they have been "lucky not to have had a particular accident". And, teachers are glad to have heard these examples to share with their colleagues and students.

That's what this book is all about. A sharing of anecdotal accounts of laboratory accidents. Hopefully, it will be a valuable resource for you to experience vicariously the many ways that people got into trouble in the lab. Hopefully, it will give you real life examples to share with your students.

I should point out that although these accident accounts have been edited for general technical correctness and consistency of style, no attempt has been made to verify the descriptions. Some accidents may, in fact, be described more than once by different teachers.

Somewhere in Tom Peters' In Search of Excellence, I read a story about a computer scientist who asked his computer: "when will you learn to reason like a human being?" The computer spun its tape drives and flashed its lights for a few moments and then spat out a piece of paper. On the paper was the answer, "That reminds me of a story."

That's how we learn best. We remember stories and we extrapolate from them easily. Perhaps, that's why Peters is so successful. It's been said that whenever data competes with folklore, folklore wins 21-0!

That's the incredible power and value of these accounts of laboratory accidents. Use them in your science teaching to help you identify potential problems. Use them to help get the message across to your "invincible" students. They'll remember these true stories. Use them so that "Learning is no Accident".

On the next page is a copy of the "Accidents" handout that we use in our science training programs. Please feel free to photocopy this page and use it in your science department for a group activity. And naturally, we would be delighted to receive contributions from you and your colleagues for the next edition of LEARNING BY ACCIDENT.

ACCIDENTS

How often have you heard someone say, "I don't have to worry about that. I've never had an accident." You can see the person's bad habits and the increased probability of disaster striking.

For many people, the "remoteness" of accidents makes them seem unlikely. Yet, each of us is probably familiar with one or more serious accidents with which we have had either direct involvement or intimate knowledge.

The sharing of these experiences heightens our awareness of the dangers in the lab.

Please spend about twenty minutes writing a summary one, two, or three of the most serious laboratory accidents with which you are familiar. Who? What? When? Where? Why?

What were the errors that were made? What might have been done to prevent such an event from occurring?

Then, please take turns reading some of the descriptions of the incidents and allow the others to identify what they believe to have been the errors and what might have been done to prevent the accident.

I would like to collect these written descriptions to include them in a permanent collection for distribution to other science teachers. Please indicate if you wish to place any restriction on use or distribution.

Alcohol lamp

503. Alcohol lamp blew up, and the alcohol leaked around the cap. We no longer use alcohol lamps. (923)

Autoclave

504. After autoclaving a bottle containing a liquid solution, I moved the bottle before it had time to cool down to room temperature. The glass stopper then shot from the top of the bottle and boiling liquid spilled all over my arm. (806)

Battery

505. My 14-year-old son and I were using battery (jumper) cables to start the lawn mower. I had my son start the car. It was in gear. The car lunged forward and smashed into the mower. It almost got me. I was lucky. (603)

506. I was in a rush to connect the battery cables. I incorrectly connected the cables. Battery flew up in my face. I rushed inside to flush my face, hair and skin. It took more than one and one-half hour to dilute it. (693)

Other cases include: 616

Blood

507. Freshman biology students were pricking fingers to type their blood samples. In two cases, students passed out as a result of becoming hyper about sticking their fingers. (525)

508. While typing blood for students in our lab, a student fainted and struck his head on a radiator. He required stitches. (548)

509. A student fainted during a blood typing lab. He collapsed into a row of beakers on a lab bench. (551)

510. A student was instructed on how to prick his finger to obtain a blood sample for blood testing. He fainted and required 14 stitches to close the gash on his head.

In the future all students are instructed to sit while doing this activity and to lie on the floor if they feel faint. (655)

511. In a biology class in New Hampshire in 1985, a student passed out during a blood typing lab. The procedure involved, extracting blood by pricking finger with a lancet, placing a drop of blood on a prepared slide, adding anti A and anti B sera and reading

the results. After a few moments, a young man came to the desk for the boy's room pass. As the pass was being prepared he keeled over backwards, fell flat on the floor and knocked his head. He was left on the floor until the nurse arrived. Fortunately he was unhurt. (937)

512. My daughter fell on the steps and cut a high gash over her forehead. Blood spurted all over the place. I had to rush her to the emergency room where she received eight stitches. (969)

Other cases include: 580, 812, 972, 973

Burn

513. A student picked up a nonasbestos pad. The hot pad burned his thumb and index finger. It stuck to his fingers until he shook it loose. (599)

514. A ring stand with ring, triangle, and crucible started to fall. The student had been working on an experiment for two hours. She was nearly through and didn't want to lose the fruits of her efforts. Without even thinking about it, she grabbed the top of the ring stand post and suffered second-degree burns on her hand. (619)

Burner

A. Alcohol burner

515. Long straight hair was very popular with the girls in 1972. In my IPS class a girl turned her head quickly and it passed over an alcohol burner. Her ponytail caught fire and her lab partner put the fire out with her hands before I could get to the girl. There was no injury except shorter hair. (523)

516. A teacher, knowing she would be out, arranged for a film, a written assignment, and an IPS lab. The department chairman had a substitute teacher do the lab. The lab involved using alcohol burners. During the lab several students were refilling the burners from a gallon container of alcohol. One of the students did not notice that the wick was not completely extinguished and due to poor visibility of the alcohol flame, the vapors ignited and a number of students were burned. Two required extensive hospitalization and reconstructive surgery. (555)

517. In a freshman science course an alcohol burner ignited. A student brushed it onto the floor and yelled, "fire." Students near the fire moved back. Another student went to the sink and filled a beaker with water. The teacher quieted the class by speaking calmly. He tried to blow the fire out (it was small). He accepted the beaker of water and poured it over the fire and the burner and he made sure the fire was out. Then, the

teacher instructed the student to clean up with large bunch of very wet paper towels. Fortunately no glass was broken.

The teacher praised his students for quiet, calm behavior. (572)

518. Students were asked to use alcohol burners as heating sources. One student dropped the lighted burner and her sleeve caught on fire. The teacher immediately brought her to the safety shower. It did not provide water when activated. The fire blanket had deteriorated. The teacher then removed his coat for use in smothering the fire.

The girl was moderately burned but psychologically the damage was very great. It is currently in litigation. (645)

519. In an IPS class a student was heating a test tube of water with an alcohol burner (methyl alcohol). The top to the burner was not on tightly. The burner knocked over and ignited the counter top. The student tried to blow out the fire. It spread across the counter. The students got my attention and stood back. I took the fire blanket and threw it on the floor. The fire was extinguished. (662)

520. A large eighth grade IPS student knocked over the alcohol burner. The bottle broke and the alcohol spilled out. There was a roll of paper towels standing on the lab bench. It was quickly saturated with alcohol and instantly caught on fire. The fire was soon extinguished with the fire extinguisher. We were lucky. (663)

521. A teacher was running a self-paced middle school physical science program from a published text program. One student was doing an alcohol burner lab while another student was working with a beaker ring stand experiment with flammable liquid. The teacher was in the back of the room. The beaker student stood up and upset the ring stand. The liquid caught fire. Both students, on fire, ran into the hall. One of the students received severe burns before the principal got a chance to catch up with her and roll her with a fire blanket. The other was in a burn ward for one year.

The school, publishing company, and the teacher were sued to the hilt! (720)

522. In 1981, an advanced science student was working in the microbiology lab after school on a science project. The project involved transferring bacteria from established cultures to sterile media using an alcohol burner to heat the inoculating loop. The teacher was in the room preparing for the next day's lab. The student inadvertently knocked over the alcohol burner on the table and alcohol spilled from the burner onto the tabletop where it ignited. The flames were difficult to see.

The student extinguished the burner. He smothered the tabletop fire with a fire blanket. Alcohol burners are no longer used. (776)

Other cases include: 555, 657, 660, 661

B. Bunsen burner

523. A female student set the right side of her hair on fire by leaning into the Bunsen burner flame. I reached for a towel from a student's counter. Before I could get to her, her lab partner put it out with her hands. (516)

524. A student could not get his Bunsen burner lit. The jet remained open for some period of time as he tried to light the burner. Finally, after repeated attempts with the flint/striker, the entire area burst into flames.

The teacher immediately shut off the gas at the main valve and the flames subsided. There were no injuries or damages. (576)

525. A college student was drying a burette with acetone at the lab bench across from mine. Impatient with the process, he warmed the burette with a Bunsen burner and soon had a flame jet shot from the mouth of the burette. He shook the burette into the sink and the flames from the acetone shot up to 23 feet. The student snapping his fingers couldn't remember the word he was looking for "Fire". Cooler heads prevailed, an extinguisher was applied and the crisis was soon over. (579)

526. During distillation of a flammable liquid vapors were ignited due to the improper containment of vapors, i.e., collecting vapors by condensation in a test tube that is in a cold water bath. In the case sited, the tubing carrying the vapors to the water bath was knocked out and the Bunsen burner ignited the vapors. (607)

527. In a middle school, two girls were working with Bunsen burners. One turned on the burner without telling her partner. The partner bent over to check the adjustment while the first girl lit the burner. Since the burner was on for about 15 seconds, the second girls face and head was in the "fireball" as the burner and excess gas went up in flames. Her hair and eyebrows were singed almost completely off. (671)

528. During a high school chemistry lab, when I was a student, someone turned on a gas valve then left to get a match. Another student struck a match to light a Bunsen burner nearby. A flash of flames singed the hair off the face and arms of the student. This was an example of gross negligence. The student should have had more common sense than to walk away leaving a gas valve turned on. (678)

529. After demonstrating the proper technique to be used in lighting a Bunsen burner, students were instructed to put on goggles and aprons and go to the lab to practice. As I was moving from one lab group to the other, a student in the back of the room forgot to check the gas adjustment valve on the burner. He lit a match, turned on the gas and the top of the lab table caught fire.

There was not a gas adjustment valve in the burner. A fellow student had removed it as a joke. The gas poured out the bottom. Fortunately, only a few hairs were singed. A student at another station reached over to turn off the main valve as I was too far away to be of help and the student was frozen into a motionless state. (728)

530. While using a Bunsen burner, a student pulled the hose off the burner. The fuel ignited as it came from the nozzle, making a torch. The student became so scared he froze. Fortunately another student saw what was going on and turned off the gas supply. The students were not seriously burned. (729)

531. During a lab, a girl in my accelerated group reached up to tighten a clamp on the bar above the worktable. She reached over the Bunsen burner her wool sweater caught on fire. Her lab partner immediately hit her and put the flame out. There was no injury to either girl. (732)

532. I was taking a chemistry class in high school. One day during a lab, a young man nearly died from severe burns to this head. It all happened so quickly that it still seems like a blur. A girl caught her hair on fire and when the victim saw this, he tried to save her hair. He got his arm tangled in the Bunsen burner. Another girl increased the flame in panic and his face was severely blasted. By the time calmer head got control the boy was in serious shock. (757)

533. In Hudson, New Hampshire (1984), two teachers were attempting to unblock the pipes that lead away from the fume hood. Birds' nests had blocked the hood's outside holes. The teachers thought they had cleared the passages. When they used a Bunsen burner in the fume hood it exploded. Both teachers were severely burned. (802)

534. In New York State, 1982, eleventh graders (Regents Chemistry) were heating a hydrated salt to remove water and find the percentage of water. One student, contrary to instructions, heated too strongly. When it began to boil, he reached under the crucible to remove the Bunsen burner. The salt boiled over causing a burn that took weeks to heal. (842)

535. A student was working at a lab bench in the 60's. He attached a list of notes to the reagent shelf at eye level. He put his Bunsen burner on the bench, lit it, and subsequently ignited the list. Chemicals were everywhere. Fortunately, no one was hurt. (883)

536. In 1986, a student's nail polish caught fire by a Bunsen burner. It caused pain, fear and cosmetic injury. (919)

537. On the first day of a freshman chemistry laboratory, the students were learning about basic laboratory equipment and techniques. One part of the experiment dealt with using the Bunsen burner. The students were adjusting the gas flow into the burner by using the gas valve at the bottom of the burner. One student unwittingly totally unscrewed the valve so that it fell off. When she turned on the gas, it came out both from the top and the bottom of the burner. Therefore, when she lit the burner after a few seconds, fire came out the bottom. The rubber tubing used to connect the burner to the bench cock was old and had chemicals on it, so it too caught fire. I immediately

put out the fire with an extinguisher since the student froze. Possible dangers: overcrowded lab, stools crowded the aisles making impossible a quick escape. (951)

538. A student was heating a test tube set up in a ring stand with a Bunsen burner. She accidentally pulled off the gas tubing. A flame shot out from the table. The student was not hurt but she "froze" and couldn't react. A fellow student reached over from the other side of the table and shut the gas before I got there. Luckily, no one was injured. (959)

539. In a high school chemistry lab in 1970, a boy reached over his lit Bunsen burner to get a chemical off the shelf. He set his shirt on fire. We now are sure we do not place chemicals on the shelves above the lab benches. (970)

Other cases include: 560, 582, 600, 619, 682, 705, 753, 782, 833, 850, and 851

C. Gas Burners

540. At a high school in 1986, LPG fueled the gas burners in the lab. The tank was outside and piped in through the basement to the two science classes. Someone entered one of the classrooms and turned on several gas jets at night. In the morning, the custodian noticed the odor before he put the lights on. The class was closed for two days to allow for ventilation. After that, the central gas shut off was kept off, unless it was requested to be on by one of the teachers. (826)

D. Propane Burners

541. A teacher burned his hand while using a propane burner during a class. Someone installed the valve incorrectly. (518)

Chemicals

Acetone

542. Many years ago I had a practice teacher who had recently discovered that the glassware could be cleaned and dried by using the sequence of soap and water, distilled water, alcohol and finally acetone. Thinking that the glassware was finally dry, the teacher had the students set up the experiment to prepare oxygen gas by allowing water to drop from a dropping funnel onto sodium peroxide. Probably eight or ten such setups in the lab were set off because the energy released by the exothermic reaction was enhanced by the residual acetone vapors that were still in the flasks.

Fortunately no injuries occurred but things were really popping for a while. (650)

543. An experiment involved dealing with acetone on paper chromatography. A girl in the lab became fond of the odor given off by the acetone after she had been told not to inhale it. She became nauseous at home and was taken to the hospital. She stayed over night. (697)

544. A student tried to dry an Erlenmeyer flask over a burner after rinsing it out with acetone. It burst into flames, he dropped it in the sink and the sink ignited. I used a dry chemical extinguisher and had to evacuate the lab because of fumes. He was not hurt. (740)

Other cases include: 525, 589

Acid

545. A student stole a bottle of concentrated acid and placed it in another student's locker. When the student opened his locker the bottle crashed to the floor and broke. (552)

546. An employee spilled a large container of acid. The acid was diluted and caused damage to his clothing. Immediately, he flushed himself with water and no injuries were reported. (586)

547. While I was a student in high school, I volunteered to help clean the chemistry lab. During the clean up, I pulled an evaporating dish off the top shelf that was over my head. Some "water" spilled on the front of my shirt and hands. I washed and dried my hands and used paper towel on my shirt.

That afternoon, as I was dressing for baseball practice, I noticed a hole in my shirt. By the time I got home I had only a row down the front where the fabric was double and a red stomach. The "water" was acid of some type. I was fortunate. I could have lost my sight. (730)

548. The department head at my school has several student lab aides who set up labs and do other chores. Last year, a senior girl was a lab aide. One day she was making up an acid solution and she carried about 200 ml of concentrated acid in a 500 ml beaker. Before she got to her destination the bottom of the beaker just plain fell out. She had not noticed any defects in the beaker. Anyway, the acid poured down the front of her. I was teaching a class at the time but the department head was sitting right there and she immediately began to pour water all over the student. The shower was on the other side of the room. Once the acid was fairly diluted she went to the locker room to continue rinsing herself. There were no burns or irritations but her new slacks were ruined. (822)

549. April 23, 1987, in Winsted, Connecticut, a high school junior was doing an acid/base titration. She picked up some spilled chemical, either 0.5M hydrochloric acid or 0.6M sodium hydroxide. She wiped her eye and it started to burn. The teacher

flushed her eye for ten to fifteen minutes with water, then she send her to a local hospital for observation at the emergency room. Luckily there were no burns, only irritation. Her lab glasses were hanging around her neck. (833)

550. In 1963, we were working with acid during a high school chemistry lab. Some acid spilled. Small droplets hit my shirt. They made holes in it. I did not realize it until the next day. (858)

551. In college, I dropped a tray of concentrated acids and bases. I was overcome with fumes until a professor took me to the sink. (899)

552. A ninth grade student was told not to touch the acid bottles on the demonstration desk. She did and then she touched her mouth. She was afraid and did not mention any word to the teacher. Her lips started burning. She put Chap Stick on her lips and sealed it in the acid. She had to go to the doctor the next day to treat her lips. (948)

553. During a middle school IPS lab, a student spilled concentrated acid on a pair of designer jeans. The jeans sported new holes and large discoloration spots. No attempt by the classroom teacher was enough to protect the students. The parents complained. This prompted some safety modifications. (832)

Other cases include: 633, 674, 828, 871, 885, 907, 909, 932, 937

Agar

554. A student was making two liters of nutrient agar in a prep room as part of an independent study project. He was using a two-liter beaker and heating it directly on a gas range. When the agar dissolved he picked up the beaker with tongs. The bottom broke out spilling very hot agar all over his shoes and pants. He was very uncomfortable for a while but his accident did not require medical treatment. (580)

Alcohol

555. A student opened up an alcohol burner while it was burning. The alcohol spilled on the student's hands. Luckily, it was put out without damage. The student had not followed the instructions. (517)

556. A seventh grade general science teacher was pouring alcohol from one container to another and it ignited. Nearby was a burning alcohol lamp. Soon the teacher had a burning lab tabletop. Fortunately, there were no injuries. (564)

557. Four students received third degree burns over 70% of their bodies. A Vermont private school hired a non-certified, yet qualified science instructor. This instructor was demonstrating phase changes of liquids to a gas using a nontraditional technique

heating alcohol in an open container with an open flame. Once the initial 100 ml had evaporated, several students wished to observe the demonstration once again. The instructor consented and poured approximately 100 ml of alcohol into another beaker leaving the supply canister uncapped. She poured it directly into a hot beaker with open flame underneath. Needless to say it flashed. All the students were huddled around and one knocked over the supply container onto the floor where it exploded. The rest was a disaster. A six million dollar lawsuit followed. (567)

558. In a ninth grade IPS class, a lab group was heating a flask with an alcohol/water mixture for fractional distillation purposes. The flask was not held by a clamp, as it should have been. In checking the apparatus I did not notice it wasn't clamped.

While heating with a Bunsen burner the flask got knocked to the lab bench top, caught fire and caused the wooden test tube rack to catch fire. Flames headed for the wall.

The teacher put out the fire using a fire blanket. No personal damage. Students jumped back and froze. (617A)

559. A biology teacher was heating alcohol on a hot plate with open coils. The fuel source was still open on the counter. The alcohol in the beaker caught in fire. Other containers spilled in the upset and spread the fire to her pocketbook and clothing. Fortunately only minor burns resulted.

The accident resulted from a lack of planning and ignorance of very basic safety issues. (638)

560. A teacher was having students in an ecology course prepare specimens of plants and animals indigenous to that area as part of her natural history unit. One of the activities suggested was the preparation and mounting of skeletons. In the preparation of bones the students were to boil the bones in alcohol to free them of grease. The set up in the room consisted of six boiling stations, each equipped with a 1000 ml beaker, and about 500 ml of alcohol. This was to be heated by Bunsen burner. Few minutes before the end of the class, the students turned off their burners and dried their bones. Students in five of the stations discharged the alcohol, the sixth just turned off the burner.

The next class entered and the teacher was in the storage room next door. Some of the inquisitive kids explored the new "toys" on the back counter. By this time the alcohol in the sixth burner ignited. One of the students acrylic sweater caught on fire and the student was severely burned.

Moral: Watch whom you share a room with. They may not be as safety conscious as you. (723)

561. In an organic lab a lab partner was pouring alcohol into a reflux condenser. When he spilled some of the alcohol down the hot plate, it burst on fire. A fire extinguisher nearby saved the day. (725)

562. During my first year of teaching, I was having my advanced anatomy class extract chlorophyll from plant leaves. This requires boiling the leaves in alcohol. I had several

beakers of water in a large pan on an electric stove. One of the students accidentally spilled some of the alcohol on the burner while putting his test tube into the water bath. The alcohol ignited and ignited all of the other test tubes. I threw a wet towel over the pot. (734)

563. In January 1986, at Booth Jr. High School in Fayette County, Georgia in an eighth grade junior high earth science class; the teacher was demonstrating a volcanic eruption. During the first period, the ammonium dichromate volcano worked properly and all went as planned. During the second period demonstration when the teacher added alcohol as an ignition, the volcano blew up. Several students were seriously burned. (795)

Other cases include: 577, 591, 660, 715, 823, 842, 857

Ammonia

564. A student entered the class and picked up a stoppered bottle of highly concentrated ammonia. He unstoppered the bottle, and took a deep "whiff" of its contents. She did not "quaff" the vapors. The results were immediate and uncontrollable flow of mucous from the nose and tears from the eyes. (535)

565. A careless student spilled concentrated ammonia. The fumes caused coughing, gasping, etc. I saved the day, by using a lot of water to dilute the ammonia and helped in mopping the floor. (625)

566. After some discussion on the proper way to smell an unknown chemical substance, a student was asked to demonstrate. A vial of ammonia (smelling salts) was broken and handed to the student. He was instructed to show the class proper technique. He took the vial and put it to his nose. He took a deep breath and fell down. (682)

567. In a freshman chemistry lab, a student pipetted 15-Molar ammonia by mouth. He got 56 ml of the solution in his mouth. The roof of his mouth "fell out", and the student fainted. He was taken to the hospital by an ambulance within 10 minutes. He was hospitalized for two days. (752)

568. A student deeply inhaled ammonium hydroxide wondering if it was similar to household ammonia. His breathing was temporarily "arrested". He did this in spite of repeated warning to not sniff or smell any chemicals. (773)

569. A friend of mine had a problem with their septic tank backing up into the bathroom and eventually into the finished playroom in the basement. Once the septic tank problem was taken care of, she set about cleaning the playroom. She used ammonia and bleach to clean the area. The fumes generated burned her throat, eyes and she had to be taken to the hospital. (989)

Other cases include: 587, 939

Ammonium Hydroxide

570. A substitute teacher with no science preparation had the class build kites. The kites were stored in the storeroom. The substitute permitted students to retrieve the kites without supervision. A student stepped on the bottom shelf to reach the kites. The shelf support dislodged and the shelf dropped and bottles of ammonium hydroxide, glacial acetic acid and isopropyl alcohol fell to the floor. Dense fumes formed. The fire department was called. Hose lines were run to the room on the second floor and smoke evacuation fans were used. (526)

Other cases include: 568, 902

Barium Chloride

571. A tall ninth grade boy threw barium chloride over his shoulder joking that salt over your shoulder is good luck. A girl standing behind him had her mouth open and the barium chloride landed in her mouth. (Couldn't do that again if he tried!) She spit it out, washed her mouth with water. We called the Poison Control Center who reassured us. (771)

Benzene

572. A chromatography experiment required the use of benzene. The benzene residue was disposed of in the lab sink. A ninth grade IPS class did a flammability test on an unknown at the sink as instructed. The student dropped the paper into the sink as instructed. Fortunately, the student jumped back in time and everyone left the room until the "fallout" was over. (661)

573. An experiment required using benzene, seeds, electrodes and a spark coil to illustrate "dipole moments". It resulted in ignition of the solvent. Major problems arose when a fire extinguisher was used to put out the flaming beaker.

The errors were in the instructions given to the students, selection of the solvent and instruction on the use of fire extinguisher.

A better experiment was the "safety shoot." (708)

Bromine

574. A student was working on a laboratory preparation of liquid bromine. He had collected the bromine in a test tube. The student spilled and burned his right hand fingers, during the transfer of the unsecured test tube.

Gloves were not used, and the safety instructions were not given and the directions of the experiment did not detail a procedure for the collection of the liquid bromine. (508)

575. A chemistry teacher was helping a student with a science fair project before school began. The project involved separating chemicals using bromine. The teacher wisely decided to do that part for the student. The bromine water failed to go into the opening of the separatory funnel and ran down on his hand.

Severe burns and tissue destruction resulted instantly. He held his hand in running water and removed his ring. The burns were the worst under the ring, which was also discolored.

One of the first aid charts suggested the use of glycerin as a soothing ointment. It took over a month for the wounds to heal but they only left faint scar tissue. There was no permanent impairment but it did look terrible while the healing was taking place. Severe pain was experienced for the first several weeks. (519)

576. In the second half of a general chemistry class, a student came in late and unprepared. The experiment involved the use of bromine. Rather than speak to the professor and prepare properly, he copied the set up of another student. He began to boil the bromine and the fumes began to spread throughout the lab. The student left his workbench to obtain other reagents. The professor became aware of what was going on and dismissed the student from the lab. (680)

577. In 1974, a second year high school senior chemistry student was working on a science project in a laboratory adjacent to my classroom, under the direction of his chemistry teacher. This project involved the production of liquid bromine. The student brushed the collection container off the desk and then tried to catch it. The container broke and it covered the student's arms with liquid bromine. He was severely burned in spite of a speedy trip to the safety shower followed by flushing with alcohol. He was permanently scarred. (781)

578. The instructor had the stopcock open while filling a large burette with bromine in an organic class during the pre-lab explanation. Bromine bottle hit the desk and broke. It covered his hands and bromine Fumes filled the air. The instructor had bromine burns. The class was canceled while first aid was given. (1000)

Butane

579. This accident happened in October 1986, at Henry Abbott Tech. In a study hall being housed in a chemistry lab, a student filled an empty pen with butane and lit the gas in the pen. The pen cover also ignited and the student panicked throwing the pen

into the radiator that was on. The radiator contained a mountain of warmed gum wrappers. They instantly ignited. There were flames three foot high.

Two students tried to put the fire out although the teacher had insisted all students leave the room. One student was sent to pull the fire alarm and found that it did not work. A second alarm was tried and the alarm was sounded. The gas in the lab was shut off, the room and the school was evacuated.

Since this happened at the end of the day, the school buses blocked the entrance for the emergency equipment. The fire went out, no one was hurt, but it took 55 minutes to get emergency personnel on the scene.

The incident resulted in a new set of policies for:

1) Butane and all lighters
2) Students attempting to use fire extinguishers
3) School bus parking at the end of the day
4) Cleaning radiators
5) Safety equipment in labs
6) Repair of fire extinguishers. (804)

Butanol

580. Several years ago, I worked in a medical laboratory and had to perform a routine blood test for iodine. The procedure involved extracting the iodine with butanol, evaporating the butanol and then converting it to inorganic iodine with chloric acid. I guess I had not evaporated all the butanol and on being heated with chloric acid it exploded. Luckily, no injuries were resulted. (837)

Carbon dioxide

581. I wanted to discharge a carbon dioxide cartridge in class, allowing it to get cold to demonstrate loss of heat in decompression. I had arranged a means to hold the cartridge with pliers. I had a student hold the pliers tightly while I broke the seal. The student was startled when the seal broke giving off a loud hiss. He let go of the pliers. The cartridge took off like a bullet, bouncing off the back wall of the room. (698)

Other cases include: 767

Carbon disulfide

582. A student lab team of three girls in the eleventh grade had been performing an experiment with carbon disulfide and sulfur crystals. Upon completing that part of the lab, the waste carbon disulfide was poured into the lab sink. The next part of the experiment required heating sulfur. Upon lighting the Bunsen burner, the match was thrown into the ink. Flames promptly arose from the sink. Turning on the faucet put out the fire. The students were not injured.

The accident would not have occurred had carbon disulfide been disposed of properly, as well as, the match or even if the sink had been flushed with water. (783)

583. In Connecticut about 1:00 P.M. in an eighth grade classroom in 1978, a teacher spilled carbon disulfide which had phosphorus in it. The teacher was demonstrating spontaneous combustion. He evacuated the classroom and dried the solution with a cloth. Since then, the demonstration has been discontinued. (880)

584. Before we started the experiment the instructor explained all the warnings and preparatory phase. The experiment involved separation of the components of a mixture containing carbon, sulfur and sodium chloride. The class was told not to bring the solvent containing carbon disulfide near open flame. One student did and her synthetic fiber sweater caught on fire. Much embarrassment and second-degree burns. (990)

Other cases include: 686, 698

Charcoal

585. A neighbor was critically burned while lighting a charcoal fire for the barbecue with lighter fluid. The flame followed up the can and it exploded. He died a week later due to his burns. (601)

586. A young male was starting a backyard barbecue using charcoal. He poured charcoal lighter starter onto hot coals. As he released pressure on the can he created negative pressure in the can. The fire ignited and was sucked back into the can. The can exploded. The boy received severe upper body burns. He had several months of hospitalization and plastic surgery. (701)

Chlorine

587. In my early days of teaching, I was doing a lab with high school senior boys using chlorine collected by displacement of air in a wide mouth bottle. One part of the student procedure was to blow across the bottle mouth to check for moisture affinity as in hydrochloric acid.

One of the students put the bottle up to his face and then inhaled preparatory to blowing, getting a respectable dose of the gas. He reacted immediately by starting to cough. I made him inhale a whiff of ammonia and sent him to the school infirmary. I stood by for a couple of hours while he tried to cough his lungs out and I sweated blood.

No permanent damage. Last time I heard about him he had become a doctor. (654)

588. The instructor was not aware of the recent ductwork and removal of upper hood duct. He was generating chlorine in a hood. Fumes diverted into the stockroom. The administration refused to evacuate but did call the fire department on the persistent advice of the faculty. (710)

Chlorophyll

589. In 1978, students were performing an experiment, from the BSCS (green version) lab manual on chromatography. The experiment called for the removal of chlorophyll from fresh spinach by placing spinach, sand and acetone in an electric blender and mixing for three minutes. As soon as the blender was turned on the acetone ignited. I would imagine the friction between the sand and the blender caused the blender to ignite. No one was injured. I had performed this procedure about a dozen times before this accident. (766)

590. In Alvine High School, May 1987, a biology teacher had her students prepare an extract of chlorophyll for chromatography. The extract was prepared by heating spinach leaves in ethyl alcohol. The procedure was carried out in the fume hood and a hot plate was used as heat source. The teacher had instructed her students that there shouldn't be any open flames or sparks in the lab. She had unplugged the mimeograph machine that is adjacent to the fume hood. Every precaution had been taken to insure a safe lab situation. Near the end of the period one of her students took a pair of forceps and placed one end into an electrical outlet. A spark was created. Fortunately no fire or explosion resulted.

The student has been forbidden to participate in labs until he demonstrates that he can exercise proper lab procedure. (855)

591. I was boiling alcohol in a flask on an electric hot plate to extract chlorophyll from geranium leaves. I put a piece of cotton in the mouth of the flask to prevent any splashing. The alcohol fumes wetted the cotton and a single drop of alcohol dripped onto the hot plate from the damp cotton. The drop ignited on the plate, lit the cotton which ignited the alcohol and a fire ball shot up to the ceiling. That was in my first year of teaching. (868)

592. In October 1986, while extracting chlorophyll from a geranium leaf, I noticed the methyl alcohol boiling out too quickly. I needed to add extra solvent. I poured more alcohol from a container with a six-inch spout. Some leaked onto the hot plate and an explosion occurred. (898)

593. In 1971, West High School, during chlorophyll extraction lab, it was suggested to use a blender for the solvent extraction. A small amount of solvent had been spilled on the tabletop. When the blender was turned on the solvent on the table caught on fire. Apparently, a spark from the switch ignited the solution. (936)

594. In my first or second year of teaching biology, I was doing a unit on photosynthesis. Students were assisting with the demonstrations. We were removing the chlorophyll from a variegated leaf by boiling it in methanol. To reduce danger from flammability, I was using a water bath on a hot plate. My assistant was removing the beaker of alcohol from the beaker of water when he dropped it on the hot plate. The spill ignited and spread flames all over he table and floor.

Some papers, which should not have been near, caught fire. A "helpful" student ran in the back and brought out a propane tank he thought was a fire extinguisher. Fortunately, I saw it and snatched it away. I put the fire out with an extinguisher. If the papers had not been there, the flames would have probably burned out by themselves. (974)

595. During a Biology demonstration on chromatography in 1978, I was showing my students how to extract chlorophyll from spinach leaves. Using a water bath and Bunsen burner I was heating a combination of acetone and alcohol. The solution over flowed and the fire spread on the demonstration table. Fortunately I smothered the fire and no damage was done other than extreme embarrassment on my part. (976)

Other cases include: 562

Deionizing water

596. I had a water deionization cartridge explode on me. The granules expanded so rapidly that the plastic container ruptured. The contents were harmless but I fell off the lab table from the surprise. (925)

Dichloro benzene

597. We were going to determine the melting point and freezing point of paradichlorobenzene. Two students heated the tubes directly not following verbal instructions. One heated with rubber stopper on. The contents landed on his lab partners hands and the other open tube caught on fire. There were flames to the ceiling. (640)

Ethanol

598. A high school chemistry teacher was doing a flame test showing the color of ethyl alcohol. She had left the stock bottle of alcohol on the demonstration table near the area she was conducting the flame test. The bottle exploded producing a directional explosion outward towards the watching students. Three students were seriously burned. (558)

599. We were determining the density of water and ethyl alcohol. Both liquids were on our supply table and were in Erlenmeyer flasks. A student picked up the flask with ethyl alcohol and it slipped out of his hand. On its way down to the floor, alcohol splashed on his partner's sweatshirt creating a tie dyed effect. It also splashed on my shoes dissolving some of the dye on the leather. The fumes were very pungent and glass was all over the table and floor. Students complained of the annoying odor. Even after opening the windows it took at least ten minutes to ventilate the room. The student was obviously aware of how dropping a container with a common liquid can be dangerous. (712)

600. I was working in a sterile biological hood where ethanol is commonly used as a disinfectant. I was using an open flame from a Bunsen burner to sterilize the opening of a bottle. I knocked over the container of ethanol and it caught on fire. The fire spread over the working surface. Fortunately, the hood contained the fire and it was self-extinguishing. (805)

601. This is an old case at Clarkson College in Potsdam, New York, around 1953. While boiling an ethanol solution over a steam bath generated by a burner flame, the solution vapors fell into the flames and ignited the mixture. In attempting to smother the flame, the solution was knocked over. Some spilled on hands and caused severe burns. (873)

Other cases include: 590,594, 675

Ether

602. In a college chemistry research lab, a student was refluxing a reaction with ether. He was using improperly fitted ground glass joints. Ether vapors escaped and crawled along approximately fifteen feet. Another student, unaware of the reaction that was being carried out, lit a burner. The vapors caught on fire, spread across the lab bench and the reaction vessel caught fire.

The fire extinguisher used on the flames destroyed much of the expensive glassware. Fortunately, there were no more serious problems. The loss of reactants was disturbing to the student who had spent a long time preparing them. (666)

603. In 1965, a student across the bench from mine, in the organic chemistry lab, was preparing to transfer some ether into another container. I could see the fumes of the ether "creeping" out and down toward the lab bench. About ten feet away there was an open flame. The flame ignited the ether. The beaker broke in his hand and ignited the ether all over his arm. He received second and third degree burns. (913)

604. In 1985, a student of mine was doing a makeup lab during another lab section, which was doing a different experiment. He was a senior chemistry major and was evaporating ether. He used a hot plate contrary to directions, and all prior instructions. Fortunately, he was working in the hood, because the ether caught fire. I tried to put

out the fire by inverting a beaker over the Erlenmeyer flask, but the force of the burning ether blew the beaker off and it broke. I evacuated the lab and let the fire burn out. Subsequently, I have never allowed a makeup lab unless the student is doing the identical experiment as the rest of the class. The instructors' attention should not be divided by two experiments being run at the same time. (985)

Formaldehyde

605. During a science project report, students were passing around a specimen preserved in formaldehyde or some other preservative. It was a chicken heart or similar biological item inside a sealed baby food jar. One boy dropped the jar about 6 to 8 inches onto his desktop. The jar did not break, the cover did not come off and yet some preservative somehow sprayed out into his face and eyes. At the time, we had no eyewashes of any kind so I put his head into a sink and washed out his face and eyes and called the nurse. She took him to the hospital. There was no injury to the student. (604)

606. A five-liter bottle of formaldehyde was dropped in a biology room with no ventilation. A shop vacuum was used to recover liquid and it was covered over with sawdust. (711)

607. The class was working on dissecting a pig embryo. The students were working in groups of three to four. In attempting to cut through the chest cavity of the specimen some of the formaldehyde that was used to preserve the embryo, was spilled on the student opposite to the dissector. The student panicked and overacted. She became frantic and in her effort to get to the water supply, she over turned several pieces of furniture. (755)

608. A student splashed formaldehyde in her eye while she was performing a dissection procedure. She was not wearing safety glasses. There was no eyewash facility in any of the biology labs. The student had to be sent to the nurse at the other end of the building. (849)

609. In Connecticut, workers were fixing a roof over a tank of formaldehyde. The tank was used in the making of permanent press clothes. The tank was pressurized and supposed to be "shutoff" with the safety relief valve re routed. The safety valve released and the workers were sprayed with hot formaldehyde. Two workers went to the hospital with burns, and one passed out from the fumes and two became ill. There were five men involved and five men were hurt in some way. (905)

610. A student splashed Formaldehyde in his eye during a dissection procedure. He was not wearing safety glasses and he was performing improper dissection technique. This occurred in the animal biology lab where there were no eyewash facilities in any of the biology labs. Student had to be sent to the nurse at the other end of the building. (945)

Gas

611. A new teacher wanted to do some "chemical magic." He dipped the end of a gas tube into liquid detergent and then turned on the gas to make gas bubbles. Later he ignited the tube with a match, causing small explosions. Many bubbles burst before they could be "exploded" and the room filled with a gas odor. No one was injured. (587)

612. A valve with long handle under the hood bench top controlled the gas in the hood. If a student unscrewed the valve too much, the entire storage area under the hood top became filled with methane gas. This happened once and the methane gas exploded. (648)

613. A student turned on the wrong gas jet to light a burner. The ignited gas sent a jet into the lab. The student's hair was singed. Others quickly turned off the jet. (689)

614. Gas grills with "automatic" ignition are electrically igniting the propane. If it doesn't ignite and the gas continues to flow in, finally you may get a spark "Boom"! Use great caution. (696)

615. On a camping trip, I was filling a lantern with white Kerosene gas. It was dark, so I lit a candle and stuck it to the other end of the wooden picnic table where I was working. As I unscrewed the cap on the lantern I heard the escaping pressure. Fumes escaped and traveled along the tabletop. The fumes ignited and followed their way back to the lantern that also ignited. I picked up the lantern to bury it with dirt. Some fuel spilled on the can of fuel. Fortunately, the can was closed. No one was hurt. (735)

616. Two former students broke into our high school. They had constructed a bomb with a battery timer and gasoline. They had also turned on all of the gas jets. The main shut off had been turned off by a safety minded teacher. The bomb worked. Nearby residents reported the incident. The school did not have an alarm system connected to the fire department. Four hours later the state police responded. The lab was completely destroyed. (736)

617. I was working in a gas station. One of my responsibilities was to clean engine parts prior to re installation. I took a large plastic tub and I pumped three gallons of gas into it. While carrying it back to my work area, my foot slipped on some grease and the gas poured down from my stomach to my feet. Within a minute, my skin began to sting. (754)

618. While teaching eighth grade IPS in a very expensive private school near Boston, I had the occasion of being frightened and ready to resign from my teaching profession. One day, I was late to the class due to a phone call that I received from a parent.

When I got to the class, I found a ninth grader pretending to teach a class in a goof ball manner. I send him to his appropriate room and I started the lecture. I noticed the smell of gas. Evidently, the ninth grader had turned on the main gas valve and proceeded to turn on two gas jets at the lab stations.

The principal felt this could be handled in house. I refused to enter the lab unless a lock and a key were provided for the main gas shut off valve. I requested only two copies of keys, one for me and one for the head custodian. I warned the authorities and continued by telling them that if my demands were not met there would be no more labs and I would resign at the end of the school year. He met my demands. (835)

619. This happened in a New York Public School on Long Island. In a chemistry class, the students were going to work with Bunsen burners which had all been checked and were properly working. However, there was a homeroom in the classroom with a non-science teacher. Apparently someone fiddled with the screw on the bottom of a few of the burners. When the students tried to light their burners, a few of them complained they would not light. As the teacher began to help the first group of students he quickly noticed the smell of gas and recognized the problem. He ran to another group who was trying to light their burner with a spark lighter. He pushed them away just in time before a fireball exploded from the burner. All the hair on his hand was completely singed off. Luckily there were no other injuries. There was a great potential for at least two or three students to have been badly burned.

Since this happened the administration has made attempts to comply with our request that science classrooms not be used for other classes or for homerooms of teachers other than science. (872)

620. In 1973, a Volkswagen caught on fire due to improper engineering. The gas line connected directly over the engine exhaust manifold. I went back in the house to get my wallet while the engine was idling. A fire started and all I could do was watch. (933)

621. I allowed too much gas to escape before lighting the oven. The gas ignited and burned my face and hair. This occurred in my kitchen. (965)

Other cases include: 529, 530, 538, 554, 579, 643, 654, 706

Gasoline

622. As a teenager I remember my brother was working in my father's workshop on a gasoline engine using gasoline. The gas spilled and ignited. I ran downstairs to see what happened. I ran upstairs to get baking soda. My father poured water on the fire and fortunately the fire did go out. My brother then informed us we were lucky since gasoline fires can spread by trying to extinguish them with water. (848)

623. Someone poured gasoline from a five gallon can over a brush pile that had been built on at the same site as the previous day. The gasoline caught on fire. The gasoline splashed on the person’s body and he was in flames. He rolled to put out the flames.

He received minor burns on one hand. Gasoline can, boiling gas, stayed until cool. (995)

Gun powder

624. In Westerly High School, Rhode Island in 1953, a chemistry lab involved separation of the components of gunpowder. Some students tried to put the components back together. The result was an explosion. No one was injured. (889)

Hydrochloric acid

625. While cleaning test tubes in the chemistry lab, a student assistant scratched his ear while he was holding a tube containing concentrated hydrochloric acid. He poured the acid down the side of his face and neck. (521)

626. A student was stirring a mixture of copper oxide and copper together with hydrochloric acid in a test tube. He broke the test tube because he didn't follow instructions. Instead of stirring lightly and not going near the bottom of the test tube, he was very rough in his actions, tapping the bottom of the tube. (597)

627. During the completion of a lab, a substitute in a middle school asked a class to stopper and shake the test tube containing hydrochloric acid. The student incorrectly shook the tube causing the stopper to fly out spraying hydrochloric acid in his lab partner’s face. (673)

628. A female student took hydrochloric acid from the storage table and dropped it. The room filled with a cloud and the girl spilled some on herself. She fled and went right to the girls' room to take off her clothing. She washed off her skin. I made sure the exhaust fan was on.

I evacuated the room and tried to get help. I send few students to get the nurse, the housemaster and the janitor. No one could be found.

We stayed out of the room until a janitor finally came. He knew enough to use plain water to clean the floor. (691)

629. While I was a lab assistant in college, I was making a large container of dilute hydrochloric acid. I added a lot of water to the concentrated hydrochloric acid. The fumes were overwhelming and I evacuated the lab. I felt very stupid. (713)

630. After giving verbal directions to my junior chemistry class, the student left their desks and walked to their lab stations. The first thing they were instructed to do was to put on an apron and a pair of goggles. One girl was reaching down to get her apron and goggles. Her partner was curious about the reagent bottle of dilute hydrochloric

acid and picked it up to read the label. It slipped from her hand and hit the lab table. The ground glass stopper popped out and the girl who was reaching down for her goggles got splashed in the face and eyes by acidic solution.

The goggles and aprons should be located outside the hazard area where dangers exist and students should wear them before entering the area. (721)

631. In an organic lab hydrochloric acid was being generated as a byproduct. The acid was allowed to bubble into the water. The reaction appeared to stop when the solution almost immediately solidified. The reaction vessel was opened and the acid was rushing out. The experimenter was standing close by and he received a good whiff of the gas almost causing respiratory arrest. (731)

632. In 1974, I was a senior chemistry student. One day late in afternoon, I was working alone in the laboratory. I was placing a half-filled bottle of hydrochloric acid back on the shelf to clean up. I was in a hurry. The bottle broke when I hit it against the shelf. It did not splash on me but the choking odor filled the room. I turned on all the fume hoods and doused it with sodium bicarbonate then diluted it with water. I then cleaned it up with paper towels. (786)

633. In March 1987, an honors chemistry laboratory was performing an acid/base titration. I prepared a 1.00 molar hydrochloric acid solution (approximately 500 mls). The students were using the acid solution to standardize their base, sodium hydroxide. A student came to the desk and poured out the required 20 mls of the solution from the 1000 ml Erlenmeyer flask. Upon setting down the flask, the bottom of the flask broke. The hydrochloric acid solution went on the bench and ultimately on the floor. There were four students in the area. Fortunately, all students had their gloves, aprons and goggles on. We cleaned up the solution with paper towels. (814)

634. In 1896, in Newton, Massachusetts, a school custodial worker was carrying a leaking gallon container of concentrated hydrochloric acid. He dropped the container. He bent down as it fell and it splashed up into his face. Since he was required to carry cases of hydrochloric acid down stairs, he was wearing gloves and eye protection. He should have been wearing grip proof gloves. (817)

635. In 1987, an honors chemistry class was using burettes filled with hydrochloric acid. I was taking a reading at one station and put my ungloved hand behind the burette. It broke in two spilling the contents on my hand and the table. Fortunately, it did not splatter. I was able to hold onto the broken half so it didn't shatter over the table. (820)

636. In New York City in 1987, a student was inverting a gas measuring tube, The tube contained six molar hydrochloric acid and distilled water. Somehow, the hydrochloric acid came in contact with Magnesium, which was at the bottom of the tube, and hydrogen gas was generated. The tube sprayed hydrochloric acid and water in the student's face. Fortunately, she had her goggles on. (894)

637. A high school chemistry student was wearing goggles and a lab apron. She managed to pour a small amount of concentrated hydrochloric acid from eye level over the top of her lab apron down her front. A small amount was involved. Although a shower was available, I elected to rush her across the hall, strip her and wash her down in the girls' room. Her blouse reacted and her bra dissolved. If it had been sulfuric acid, I would have put her under the shower.

I instantly evaluated the accident and made the judgment call that stripping this Hispanic diplomat's daughter in front of a coed class would have been more traumatic than rushing her to the girls' room as I did. Sulfuric acid, nitric acid, etc., no question, shower. (906)

638. In a college lab, a male student was speaking to me while he was pouring a liquid (hydrochloric acid.) It spilled down on my lab coat and my closed shoes. It disintegrated my lab coat and my shoes as well as my nylons. (916)

639. A student lab assistant turned while holding a two-liter beaker filled with concentrated hydrochloric acid. She hit the beaker against the edge of the bench breaking the beaker and spilling the contents on her skirt and legs.

The teacher immediately picked her up and put her in the sink and washed off the hydrochloric acid. No injury occurred except one pair of disintegrated panty hose. (996)

Other cases include: 549, 644, 654, 776, 841, 845, 979, 995

Hydrofluoric acid

640. In 1974, while I was a graduate student at the University of Connecticut, a student was carrying a container of hydrofluoric acid up a stairway and fell. The acid spilled on her arm giving her severe burns. (986)

Hydrogen

641. A student was doing an electrolysis experiment for a science fair project. The hydrogen was being used as an alternate fuel source. This was my first year of teaching and the student was that of another teacher. On this day, we combined our classes to look at and demonstrate some of the projects. There were approximately 40 students and two teachers in a relatively small room.

As I remember, the hydrogen was to be pushed out of a storage device (small glass jar) by water displacement and burned by mixing with air at another point. I was elected by the other teacher to light the hydrogen. The fire backed into the glass jar and exploded. No one was injured. But, my awareness for safety was enlightened. (507)

642. While producing hydrogen in a large quantity in a 1000ml flask, a glowing splint was placed at the mouth and the resulting flame burnt the hair off the students' arm.

This was not a planned lab and the student was doing this as a fun activity. The teacher did not authorize it. The student was removed from the lab for the year. (557)

643. After teaching how to use a test tube of hydrogen as a torch before igniting jet of gas being produced, a student immediately lit the jet with a match. Air mixed with hydrogen caused explosion of apparatus. Fortunately, no injury occurred. (626)

644. In the experiment involving the reaction of zinc metal with hydrochloric acid to produce hydrogen gas, the instruction manual said to hold the test tube containing gas upside down. It said to place the lighted wood splint at the mouth of the test tube. I always wondered if there was a possibility of the test tube shattering as a result of this. So, I told students to always wear eye protection and hold the test tube at arm's length with test tube holders. As it turned out, one day, a test tube did explode as a result of the experiment. No one got hurt because all my instructions had been followed. I feel these safety steps should be added to lab manuals for this common experiment. (632)

Other cases include: 711, 723, 730, 739, 845, 995

Hydrogen peroxide

645. Because everyone remained calm no students were hurt the day the paint on the new iron rings caught on fire in one lab group. Another lab set up was knocked over and another student at the same moment broke the beaker of hydrogen peroxide. We let the iron ring fire burn out, picked up and mopped up the knocked over experiment and beaker. (760)

Hydrogen phosphate

646. A woman instructor from the Biological Division of our college asked if she could do some work of her own using our lab space. Apparently, whomever she talked to said fine and assumed she was knowledgeable about what she wanted to do.

The chemistry labs were not in session and no one was on duty when I just happened by. I found that she had just dropped a two-liter glass bottle filled with concentrated hydrogen phosphate acid on the floor. She did not use a carrying device and was not wearing goggles or an apron. She was bending down on the floor trying to clean it up.

I immediately told her to go to the next room and remove any clothing that had been splashed, wash herself, etc. She had almost no slacks on by this time.

Subsequently, I checked on her with safety solution and the lab technician came in with a safety spill clean up kit. This is a prime example of why never working alone is important. (653)

Hydrogen sulfite

647. A student forgot the axiom "Do as you ought, add acid to water," and put hydrogen sulfite in test tube and added water. The solution bubbled up and splattered on the arm of the student causing burns. (717)

Iodine

648. In a medicinal chemistry lab in 1984 a student working next to me was mouth pipetting an iodine solution. He ended up with a mouth full of iodine. (993)

Magnesium

649. We were using magnesium strips in the lab. After lighting we put them in watch glasses, some of which were not Pyrex. One shattered upon contact with the magnesium strip. No one was hurt. But, the breaking glass startled them. (514)

650. A boy stole the key for the storeroom. He took some potassium chlorate and magnesium ribbons. He tried to make a bomb at home with the chemicals and plastic tubing. An explosion took place. Both his hands were blown off at the wrist. His home was severely damaged. (627)

651. In a laboratory, an experiment involved the reaction of magnesium powder with sulfur. The experiment called for mixing the two elements and heating it in a test tube that was held by a clamp in the hood. The reaction started vigorously. In one case, the bottom of the test tube broke and the contents of the tube poured over a student hand. The student was holding the burner in his hand. The student was burned but fortunately not seriously.

Since that time, the burners have been held in a clamp with a long handle. (646)

652. In a makeup-lab while a school was being renovated, a student took magnesium powder and threw it on a burner flame and caused a serious fire. The chemistry teacher got the fire under control before it got out of hand. But he burned his hand seriously in the process. Safety fire blankets, extinguishers, etc. were not available due to the Lab's temporary status. (539)

653. In Mount Carmel Academy, New Orleans, Louisiana, a student in a fellow teacher's class dropped a piece of burning Magnesium in her shoe. It caused a very nasty burn on her foot. The pre-lab discussion had included the correct method of handling this material. A demonstration had been given, and all possible precautions had been included. (947

654. While doing a Magnesium ribbon/ hydrochloric acid lab, one of the girls decided to pick up the gas collecting tube to see what was happening. She put her finger over the bottom of the tube and lifted it. Of course it sprayed on the face of the girl on the other side. The eyewash was used and the girl was sent to the nurse. It turned out ok. (991)

Manganese

655. I was working in an industrial laboratory. We kept a slurry of ammonium persulfate in a beaker for oxidizing manganese. We also kept a solution of sodium sulfite as a reducing solution in a phosphorus determination. Solid ammonium persulfate and sodium sulfite were both stored in five-pound boxes in the same cupboard. I needed some additional ammonium persulfate slurry quickly. Holding the beaker in one hand, I removed what I presumed to be ammonium persulfate from a box and added it to the beaker. Unfortunately it was sodium sulfite. The mixture boiled over and severely burned my hand. (642)

Mercury

656. Students were helping in the chemical storage area. The next day, a substitute was in and was conned into allowing the work to continue. There was a mercury spill that the students were afraid to tell about. Until the regular teacher was cleaning up and moving materials at the end of the year, the pool of mercury in the area remained undetected. (537)

657. Spring 1985, in an eighth grade Physical Science Class, we were doing the boiling point determination experiment. We used a 250ml Erlenmeyer flask, a thermometer, water, and alcohol burner.

Obviously, heating resulted in vapor pressure build up in a closed container. The flask exploded and the thermometer broke resulting in spilled mercury. The students were wearing eye protection and no injury occurred. If a flammable liquid was in use the results could have been tragic. We now use alcohol rather than mercury thermometers. (838)

658. In New Hampshire, 1986, we were doing the balloon construction and flight lab activity. We made a 100-gram balloon out of tissue paper, glue and tape. We went outside to try it. We were using Coleman stoves and three-foot sections of chimney pipe to funnel the hot air into the base of the balloon. One student stood on a stool holding the top of the balloon. I held the base over and around the chimney pipe. Another student held the thermometer suspended by a thread through a small opening at the top of the balloon, just as the instructions had indicated.

The balloon was pretty inflated when the student holding the thermometer dropped it. It dropped straight down the balloon and pipe into the flame of the camp stove. It burst. Holding my breath I moved the stove well away from the parking lot where the

class was working. The mercury droplets were bouncing around in the flame. The following year I did the experiment using red colored alcohol thermometers. (808)

659. About twenty-five years ago, around 1962, I set up a demonstration with a mercury barometer. A long tube in an open dish. We did this experiment 25 years ago, even though we knew of mercury's poisonous properties. A student walked casually past and knocked the apparatus over. Mercury went everywhere, all over the wooden floor, and into the cracks. We worked for hours to clean it up. (882)

Other cases include: 707, 835, 991, 992

Methanol

660. In a junior high science lab, the teacher was assisting the students with their experiment. An equipment check out room was set up in the chemical storage and prep room within the lab. The students would check out their equipment and would return it upon completion of the experiment. Two students were responsible for checking out the equipment. It also included filling and refilling alcohol burners. A student brought his alcohol burner to the check out room to have it refilled. After the lab assistants filled the burner, they proceeded to light the burner not realizing that they had not replaced the cap on the plastic pint alcohol bottle.

Apparently, the methanol fumes ignited causing a tremendous explosion. The teacher immediately rushed into the room expecting to find two dead bodies. To his amazement, the students did not appear to be seriously hurt. They seemed stunned and complained about a ringing noise in their ears, but no other physical damage was evident.

The alcohol was running down the cabinets that contained more highly volatile substances such as acetone, benzene, carbon tetrachloride, etc. Fortunately, what happened was that the explosion extinguished the flames, which could have caused a more violent explosion if the chemicals in the cabinet would have ignited.

The students were taken to the school clinic and were checked by the school nurse. She couldn't find anything wrong with them. She allowed them to calm down a little and then sent them back to class. Praise the Lord. Thank God for Miracles. (527)

661. During an IPS experiment, a teacher left a can of methanol on the demonstration desk so students could refill their burners. One of the students went up to the desk and took out his lighter and put it near the mouth of the container causing an explosion. The students' clothing caught fire. The other students near the back of the room were unable to leave since there was only one door and that was at the front. The teacher grabbed the fire blanket and wrapped it around the student. Another student put the fire out with the extinguisher. The fire alarm did not work when it was pulled. (658)

662. We were using model airplane fuel (castor oil, methanol and nitromethane) from a metal can. In the past syringes would have been used to transfer fuel. Now, 110 with more affluent times, electric pumps and batteries were put in a box together with the

fuel. Needless to say, it was not too long before the battery shorted on the metal can and ignited the methanol. (999)
Other cases include: 519, 592, 904

Muriatic acid

663. My husband was adding water to muriatic acid. It splashed into his eyes. We grabbed the garden hose, rinsed and went to the hospital for additional care. (982)

Nitric acid

664. Two girls in chemistry class were working back to back. Suddenly, one called out to the other. As they both turned around, one girl, who had a beaker of concentrated nitric acid in her hand, bumped to the other girl's elbow. The acid splashed on both girls' shoulders and ran down their arms. One girl passed out and the other panicked. We drenched both with water and then used limewater to neutralize the excess acid on the skin. Both were then taken to a local doctor. (504)

665. I allow selected students to use nitric acid from a small plastic container with a plastic, screw-on, eyedropper top. The bottle was not returned to the proper place on the shelf. Later, I picked up the bottle by the top (a mistake) and lifted it about 4 inches high before the bottom fell off. The eyedropper lid had barely been screwed on. The acid splashed directly into my eye. Fortunately, the sink was about three feet away and there was no damage. (511)

666. A teacher was attempting to generate some nitrogen dioxide gas for a demonstration. In haste, he added the powdered copper directly to a small amount of concentrated nitric acid in a test tube instead of dropping the acid onto the copper. Acid splattered out of the tube onto the teacher's arms and hands along with a large puff of gas (which was not a major problem as this was being done in the hood.) The teacher washed immediately and was not burned. His shirt was ruined. (560)

667. While conducting a redox experiment, pupils were to heat an iron salt solution and then add powdered copper. Unfortunately another teacher left a bottle of dilute nitric acid nearby and I didn't see it. A pupil carelessly used the nitric acid not reading the label on the bottle, assuming it was distilled water. When he added copper, the solution erupted spilling corrosive liquid onto the floor and expelling Nitrogen oxide fumes into the area. The floor was badly damaged but no one was injured. Fortunately, everyone was using safety equipment and the room was well ventilated. The accident became a valuable lesson, as we analyzed what went wrong and illustrated that accidents often occur during seemingly harmless experiments. (634)

668. We assigned a student to dispose unlabeled bottles of chemicals. She opened a large bottle containing a gallon of nitric acid that had been closed with a rubber stopper.

The contents blew out at her. We washed it off quickly. No damage was done. The potential for harm was enormous. (665)

669. A student added concentrated nitric acid to a heated reflux reaction. He did not follow the instructions, and added the acid all at once rather than over 15 minutes. The reaction blew out back onto the student. Fortunately, safety glasses and the shower saved any permanent damage to the students' face, etc. His clothes were destroyed. (751)

670. In a chemistry lab doing quantitative analysis, we were doing Kjeldahl protein determinations. The retort bottle with nitric acid and sulfuric acid fell, broke, and released fumes. It began to eat into the linoleum floor. I threw baking soda and sodium hydroxide on the spill after opening the windows. I soaked up the mess with brown paper towels leaving a permanent scar on the floor and a healthy respect in my memory. (756)

671. A student used a hand centrifuge with a nitric acid solution during a qualitative analysis lab. The centrifuge arm broke. The students in the area were showered with nitric acid. One student had his goggles on top of his head. Acid got splattered in his eye and permanent scarring occurred. (761)

672. A professor was teaching about rocketing to the science club. He stored the chemicals under the lab hood. Nitric acid ate through the wire ring under the hood and caused a short that in turn started a fire. It produced poison gas. (798)

673. In 1971, a middle school student using a dropper bottle of concentrated nitric acid was severely burned by the acid. She had gone to the designated area for using the acid and placed on her goggles. She was to add a few drops of the acid to a test tube. While holding the dropping bottle in one hand and the dropper in the other, another student asked her for the time. She rotated her wrist to see the watch causing the nitric acid to spill on her arm. (812)

674. In 1981, a lab experiment required 12-molar nitric acid. I had the acid in Wheaton dropper bottles on an upper shelf. A high school student went to get the acid. He picked up the bottle by the dropper and pulled it towards himself. The bottle fell off the dropper splashing acid into his face. His goggles were on top of his head. I immediately took him to the eyewash and washed his eyes for 15 minutes. Then I took him to his eye doctor. No damage was done to his eyes. He had been instructed to wear his goggles, and had chosen not to.

The acid should not have been on a shelf at the eye level. A different type of bottle might have been used to store the acid. (827)

675. Two, second-year chemistry students were in the lab after school talking to the teacher. The teacher was paged to the office and left the students in the lab. One student wanted to "try something." He mixed two chemicals (concentrated nitric acid and an alcohol, perhaps ethyl), which produced nitrogen oxides. He was not wearing

safety glasses but luckily avoided direct contact with his face. He washed his face and arms with plenty of water. No permanent injury resulted. They only suffered temporary redness of the face and hands. I doubt the teacher ever knew. (844)

676. At the Pfizer Plant in Canaan, Connecticut, around 1970, a worker in the mineral lab was carrying a gallon bottle of nitric acid with one hand, up a flight of stairs. The bottle's bottom hit a step. The pure concentrated acid covered the lower half of his body. He stripped and rushed to the shower in the next building. It took months to heal. (886)

677. In 1972, I was a student in the college. One day I was cleaning some glassware with nitric acid in chemistry lab. It splattered all over. "Heat generation." (890)

678. At Ridgefield HS, in Connecticut, a student put nitric acid into a beaker as the class ended. All glassware was put into the sink. It was the last class of the day for the teacher. So, he put all used glassware in the sink and started to clean it. Water went into the nitric acid. It blew up into his eyes, face and upper body. He was out of work and under doctor's care for one year. (917)

679. In a New Hampshire, in 1976, during a laboratory experiment, a student picked up Barnes Dropping Bottle of nitric acid by the rubber top. He dropped the bottle. He made an attempt to catch it with his hands. It bounded off his hands and concentrated nitric acid poured out of the bottle down the front of his shirt and onto his face. Minor burns resulted with some permanent scarring. Sodium bicarbonate paste was used to contain the spread and control burns. (939)

680. In 1977 in the Springborn labs, a technician was heating metal samples in nitric acid. He was sitting on a stool reading a magazine while waiting for the samples to be dissolved. He knocked a beaker of acid off the hot plate and onto his knees. He was in the basement with no safety shower available. (987)

Other cases include: 637, 776, 937, 941

Nitrogen

681. I once went to a happy hour at the campus pub. I left my keys and books in the lab. After several beers, I went to the lab to get my keys and fell hitting the nitrogen tank. Good thing I had it strapped to the lab bench. No one was in the lab. (582)

Nylon

682. We made nylon. A student noticed a note on the bottom of the lab sheet that said nylon fibers would be strengthened by heat in an industrial process. He decided to use

a Bunsen burner, to heat his nylon in the beaker containing flammable liquid. A fire resulted. No injuries were reported. (789)

Other cases include: 638

Oxygen

683. The junior high principal was, at one time, a science teacher for the seventh and eighth grades. The demonstration involved decomposition of water and testing for the presence of oxygen gas using a glowing splint. He, of course, tested the wrong gas tube and an explosion occurred. The "sound of falling glass continued for 30 seconds." Surprisingly, no one was hurt. (561)

684. The accident that immediately comes to mind involves the generation of oxygen from potassium chlorate using manganese dioxide as a catalyst. The reagent and catalyst are heated together in a test tube from which a glass tube extends to a water bath. Oxygen is collected in a water bath by displacing water from inverted collecting jars. When the chemicals are heated, you have to be extremely careful not to let them touch the rubber stopper. This happened on at least three occasions during the past two years in our labs resulting in intense fires within the test tubes. The fire led to small explosions. (577)

Other cases include: 697, 703, 704, 705, 706, 739

Phenolphthalein

685. After explaining how to use a Hach water testing kit that uses reagents pre-measured in capsules, a student in class who was an "acid burn out" ate several of the capsules. We took him to the nurse. The capsules contained phenolphthalein, the active ingredient in Exlax. No injury occurred. But, the student was out of school for several days. (546)

Phosphorous

686. A chemistry teacher was required to use a small science room for lecture. He had demonstration materials on a cart. The demonstration involved dissolving white phosphorous in some carbon disulfide. When poured on a filter paper and allowed to evaporate, it ignites the filter paper. The teacher set the filter paper in a funnel so some of the solution dropped through onto the top of the cart. It was wiped up with a sponge. The filter paper and the sponge went up in flames. No damages or injuries were reported, just frazzled nerves. (565)

687. A student tucked a piece of yellow phosphorus into his pocket. The resulting fire made it difficult to remove his pants from his legs. No permanent damage occurred. (639)

688. I was in a high school chemistry class using phosphorus. We were told to put phosphorus (pea size) in a deflagrating spoon, heat it under the hood and transfer it, still under the hood, into a container containing a mixture. I tried to speed up the lab because of the crowd of students near the hood waiting to heat their phosphorus. After heating I moved away from the hood to place it in the container. The phosphorus caught on fire. If it had not been for my chemistry teacher pushing me back under the hood, I would have caught on fire. (674)

689. I was demonstrating the low kindling temperature of white phosphorus. I removed a small piece from a jar of water using goggles, tongs, apron, etc. Phosphorus burst into flames with pieces flying throughout the table. A small piece fell on my keys that were at the end of the table. At the end of the period, I picked up my keys and my body heat ignited this piece of phosphorus. As a result I still have a very bad scar today. (703)

690. A student teacher under my direction was distributing red phosphorus. He was using a knife to cut the cylinder. The friction caused the rod to ignite. The student teacher became excited and knocked over the container with many phosphorus cylinders in it. It ignited. We evacuated the students, put the cylinders in more water and began to wipe up the spill. Tiny bits of phosphorus were on the paper towels. As the towels dried the paper ignited in the trash. Finally, we carried all bits and pieces of paper to the incinerator. (763)

691. In 1965-66 school year, most of the students were on a field trip leaving approximately seven students in the class. They were all juniors. I had chosen to entertain and educate these remaining students by a series of chemical demonstrations. All safety precautions were exercised at the beginning of each demonstration. The chemicals involved were closed and returned to my demonstration desk.

At the end of the demonstration all equipment was put away and the students were given the remainder of the period as a study period. I went to work in the adjacent stockroom while the students continued with their study hall.

One girl decided to emulate a portion of one of my demonstration. This was totally contrary to my instruction throughout the year. Never do any unauthorized experiment. She mixed some potassium chlorate and red phosphorus in a glass beaker by stirring it with a metal spatula. It exploded! She received powder burns in her eyes, 23 stitches in her hand, singed hair and chemical products imbedded in the skin of her face. In addition, the flying glass cut two other students. I walked out of the stockroom just before the explosion occurred but could not reach her in time.

This former student, twenty years later, is presently a math teacher in the same Senior High School. (811)

692. In 1959, in a high school lab, we were using potassium chlorate and manganese dioxide to make oxygen. Once the Oxygen was collected, it was to be reacted with red phosphorous.
The student mixed potassium chlorate, manganese dioxide and red phosphorous. The explosion sent three people to the hospital from flying glass. One student never regained movement of his thumb.
The instructor was in the lab talking to another group of students. (843)

693. In November 1986, Canon City, Colorado, three honors chemistry students made a preparation for future demonstration called an "Armstrong Mixture." These torpedoes contained small quantities of potassium chlorate and red phosphorous wrapped in white paper. These students followed all instructions to the letter and were supervised during the procedure.
The total amount of substance prepared was estimated to be about two to two and one half tablespoons. Exactly 23 pea-sized portions were divided, separated and left to dry under the fume hood.
Very late that night the mixture detonated. The fume hood was destroyed in the explosion. All connections to the hood were intact but the fume hood itself is totally inoperable.
The reason for the detonation is unknown. A possible contamination of the chlorate is suspected. An emergency bulletin was prepared to warn many other instructors of the hazards encountered. It was recommended that the procedure not be done at all and dropped from the repertoire of teacher demonstrations. (847)

694. In 1982, a piece of yellow phosphorous was being cut for an experiment. It burst into flames. A female student broke out in red "hives." She was taken to the emergency room where it was discovered she was allergic to the specific gas produced. (878)

695. In 1985, a small spill of red phosphorus was not noticed. Another person brushed up the powder with his hand. The person was severely burned. This accident occurred in a chemistry supply and prep room in Connecticut. (885)

696. Fifteen years ago in upper New York state, a student working in a lab prep room was using a rusty knife to cut a piece of white phosphorus. He started a fire that produced a large quantity of irritating smoke. (909)

697. Westchester Co., NY 1959, in a high school chemistry class the teacher used a rusty metal spatula as he described the lab preparation of oxygen with potassium chlorate and manganese oxide. Once prepared the students were to burn some red phosphorus in a bottle of Oxygen. The teacher dipped the spatula in each of the chemicals in turn to demonstrate the amounts to use. He must have inadvertently transferred some of the phosphorus into the potassium chlorate. Later as the test tubes were being heated one set up blew up. Luckily no injuries occurred. (915)

698. Christmas, Alvirne High School, 1983. In performing a demonstration using fire writing, we prepared a solution of yellow phosphorus dissolved in carbon disulfide, leaving the solution in a plastic dropping bottle (probably a 1 oz. container.) The carbon disulfide container was left in the hood very close to the dropper bottle when the demonstration was done. The phosphorus sticks were removed to the storeroom.

After the demonstration, we left the dropper bottle and carbon disulfide container in the hood, probably several inches away from the edge of the counter top. Apparently, a small piece of not dissolved phosphorus was lodged in the tip of the dropper bottle. The carbon disulfide solvent evaporated, the phosphorus piece ignited and, the solvent in the dropper bottle ignited. When we returned from lunch the flames were spreading toward the carbon disulfide container and were also dripping over the counter edge towards the floor. We removed the carbon disulfide bottle and drained the fire extinguishers trying to smother the flames. The small goblets on the floor were taken care of. The rest of the flammable solution was pushed into the hood sink where the extinguisher foam was finally successful in quenching the flame.

Obviously, if we had the proper extinguisher the situation would have been less dramatic. No damage was sustained. We used special insulated gloves to push the flammable material into the sink. The carbon disulfide/phosphorus solution filled roughly one-half of the dropper bottle. We got the idea of the demonstration from a Tested Chemical Demonstrations book. The demo had worked successfully several times before. In retrospect, we were not prepared for the potential accident. The container should not have been left so near the counter edge and the dropper bottle should have been capped. Fortunately, we did keep an otherwise clean fume hood. (942)

Other cases include: 586, 655

Potassium

699. In a multi purpose chemistry lab, a student assistant had cut a moderate sized piece of potassium metal for a demonstration. He had it on a spatula and was moving it over to the lab bench where it fell and bounced into a beaker of hot water. The reaction was explosive. The beaker shattered and hot potassium hydroxide splattered. (583)

700. Some students in a seventh grade honors chemistry class put a piece of metallic potassium down the drain to "see what would happen." The sink and drain were destroyed. Luckily no one was injured.

Should potassium or sodium even be available for use with this age student? (770)

701. I had a small accident while demonstrating the reactivity of potassium with water. The potassium exploded when it came in contact with the water. No one was injured. (836)

Potassium chlorate

702. A student was heating a covered crucible one third full of potassium chlorate to determine
mole relationships in a decomposition reaction. The potassium chlorate was heated too rapidly and melted. It boiled over the edge of the crucible. The student's hand was under the crucible and hot melted potassium chlorate poured onto it. (749)

703. In preparing oxygen by decomposition of potassium chlorate with manganese dioxide the delivery tube became clogged with liquefied potassium chlorate and manganese dioxide. Pressure built up to a point where the test tube blew up. (775)

704. This incident occurred while, making oxygen from potassium chlorate and manganese dioxide. The student did not listen to instructions, did not read the instructions and did not wait for the teacher to inspect the set up.

What he did was to add sulfur to the two chemicals that were to be used as a test. The rubber stopper came off shooting out burning sulfur. A fellow student was hit with a piece of sulfur and it burned a hole in her blouse. No one was hurt. (895)

Other cases include: 650, 691, 692, 771, 831, 872, 940, 684, 693, 697, 702

Potassium chromate

705. In a high school chemistry class we were collecting oxygen gas from potassium chromate decomposition. The instructions were to remove the delivery tube from the trough when decomposition was completed. In order to remove the gas bottles without the loss of oxygen, the students left the delivery tube under water and turned off the Bunsen burner. Within seconds, the test tubes exploded one at a time. Fortunately, no one was injured. We have discontinued that experiment. (862)

706. In a New Hampshire High School Chemistry class, 1981, we were collecting oxygen gas from potassium chromate decomposition. The safety instructions were to remove the delivery tube from the trough when decomposition has been completed. Goggles were not available. In order to remove the gas bottles without loss of oxygen the students left the delivery tube under water and turned off the Bunsen burner. Within seconds the test tubes exploded one at a time when the water backed in. Fortunately, no one was injured. The experiment has been discontinued. (943)

Potassium Iodide

707. A student with very sensitive skin was working with solutions of mercury (II) chloride and potassium iodide. She began to itch on one hand toward the end of the lab although she did not recall having spilled any solutions on her hands. I had her rinse her hands and arms for several minutes. Then, she washed her hands with soap

and water. I suggested her to stop at the emergency room after school just to be sure. I also checked on her during the day,. She said she was doing fine. She did stop in the emergency room and was all right. I also had her fill out the accident report provided in our school.

I think I was thorough. My husband is a lawyer and the student is the daughter of a school committee member. (633)

Potassium permanganate

708. I made a solution of potassium permanganate and one kid came up to the demo table and said "Oh, Kool-Aid" and pretended to drink it. I immediately got the nurse and she gave an antidote that made the student sorry that he had pretended to drink it. (532)

Sodium

709. In demonstrating the reactivity of sodium, a large piece was put into a container containing water causing an explosion upwards and outwards. Thankfully, students were far enough away and were not harmed. The instructor was dressed appropriately but the ceiling was damaged. (536)

710. A teacher next door to me was demonstrating the sodium and water reaction. He wanted to make sure the students remembered the activity of sodium so instead of using a tiny amount of sodium and cold water he used a larger than normal amount and hot water. The explosion caused the ceiling tiles, glass, etc. to go everywhere. Luckily, no one got hurt. (538)

711. An explosion occurred when too much hydrogen was produced after sodium metal was placed in water. The glass container broke. (540)

712. A teacher left a piece of sodium metal in mineral oil was left in an unmarked beaker after a demonstration. A student placed the beaker in the sink with dirty beakers. A technician turned on the water so he could wash the beakers. The resulting explosion resulted in cuts to the technician’s arms and face. (553)

713. In a state university many, many five-gallon cans of highly volatile, flammable substances were all kept in a subbasement with virtually no ventilation. A sodium fire resulted when a container broke and sodium was exposed to the air. The stock person attempted to put out the fire with a carbon dioxide extinguisher with the result that the flames literally leaped at him causing moderate to severe burns to his hands, arms, face and head. He was hospitalized. (554)

714. A new teacher was demonstrating how metallic sodium reacts with water. Students were sitting at desks in front of the demo desk. Neither the teacher nor the

students were wearing goggles. Too much sodium was used and the beaker exploded with a piece of glass cutting a student. Luckily, the injury was not too serious. (584)

715. I destroyed some tiny pieces of sodium by putting them into alcohol. When no more bubbling took place I dropped it down the sink drain. It was too soon. A small explosion occurred in the drain. Fortunately, no damage was done. (631)

716. A colleague had carefully cut individual pieces of sodium from a much larger block. The average piece was about one-half the size of a pea. He was cutting under kerosene. Then, he allowed each student to drop his/her piece into a petri dish. All students were wearing goggles. All went well as it had been each year that he had performed this. All of a sudden, the sodium exploded in front of one girl. Her uniform caught fire. The teacher wrapped her in a fire blanket immediately but she was frantic. She grabbed her goggles and pulled them off. This caused the eyes to become seriously irritated. Burns on the skin resulted.

As she was leaving school, two students tried helping in the clean up. The sodium hydroxide burned their hands plus small bits of sodium exploded as they wiped the counter with a wet sponge. It burned the sponges considerably. (636)

717. In a general chemistry lab, a student, although warned about the hazards of sodium, deliberately placed chunks of sodium in a Florence flask filled with water. The explosion blew the flash to pieces and imbedded glass in his hand. (668)

718. This accident revolved around a demonstration performed by the teacher on the reactivity of a small piece of sodium metal in water. The sodium metal reacted actively producing a great deal of hydrogen gas that exploded. The teacher expected the explosion as it was the high light of the demonstration. However, the teacher did not expect the 600 ml beaker to break and scatter sodium hydroxide solution and small molten pieces of sodium onto the floor, as well as, the front row of student desks. Luck and foresight had caused the teacher to ask the student in the front row to move to the back of the room. Only books and papers left on the student desks were involved. A lengthy clean up ended the period. (686)

719. The experiment was the reaction of sodium with water. While the teacher was absent, a student duplicated the experiment. He used a large amount of sodium and a small amount of water. He was taken to the hospital by ambulance and treated for body and face burns. (709)

720. One afternoon after school, I was detaining two young ladies whom I had found smoking in the girl's room. I was only a student teacher at the time. The chairman of my department (a much older gentleman and one I felt wiser than me) was in the chemical storage room working. The storage room was located between my classroom and another.

Somehow, some solid sodium came into contact with some water and caused an explosion that ignited all of the flammable substances in the storage area.

The bottom line was both classrooms and the storage area was totally destroyed. Black ash was all over the third floor. Miraculously, there were no injuries. (716)

721. The chemistry lab was the closest location for the math department secretary to fill the urn-type coffeemaker. She walked into the lab one morning and turned on the faucet as was her habit. What she did not know was that the chemistry teacher who had come in early to do some lab preparation for the day, had taken some solid sodium out of its container and left it in the sink! There was an impressive explosion. Fortunately, no one was injured and there was only damage to the sink. (748)

722. A teacher was doing a demonstration with metallic sodium. He placed small pieces of sodium in a beaker of water to show reactivity. This demonstration was done with success for four classes. By the fifth class the teacher was feeling confident and got too careless. He chose a substantially larger piece of sodium. On adding it to the water, it exploded shattering the beaker and sending glass and water all over him and the front of the class. Luckily, no harm came to the students or the instructor. (782)

723. The lab involved demonstrating the reaction of metallic sodium and water. The sodium was enclosed in a small piece of paper towel. As the sodium reacted with water the paper towel helped to contain the hydrogen gas liberated. The hydrogen exploded spreading tiny bits of sodium all over the ceiling, floor and lab demonstration desk. Luckily, the students were a safe distance away. (785)

724. In 1970, a chemistry teacher was called out of class to help the principal with a project downstairs. A teacher in an adjoining room was told to keep an eye on the students. A boy in the chemistry class went to an unlocked shelf on which chemicals were stored in alphabetical order. He got a large chunk of sodium and went to the boy's bathroom down the hall. He threw the sodium down the toilet. There was a series of explosions. The toilet was shattered. The student was not injured. (788)

725. In a private school (March 1987) a teacher demonstrated the addition of sodium to water in each of five classes. The fifth time this was done an explosion occurred blowing a hole in the ceiling. Ten students were taken to the hospital with cuts from the shattered glass of the beaker. (793)

726. A high school chemistry teacher was demonstrating the reactivity of sodium with water. She had the class gather around the demonstration table and showed them how soft the sodium was. Then, she cut a piece off but it rolled away and fell into the sink and down the drain. One of the students leaned over the sink to look at the sodium. The student received moderate facial burns when the reaction occurred. (813)

727. In 1979, a teacher wanted to demonstrate the reaction of sodium in water. While she was holding the sodium storage bottle over a large beaker with about a liter of water in it he attempted to slice off a small piece. The entire piece (about a 3-cm cube) fell into the beaker.

The teacher was wearing lab coat, apron and goggles but no hand protection. The student had no protection at all. The resulting reaction caused serious damage to the teachers' hands. Three students were hurt, one seriously. The lawsuit was settled out of court. (819)

728. In Massachusetts, during the winter of 1985, a high school junior tossed a piece of sodium metal into a trough. A girl on the opposite of the bench was pouring contents of her test tube into the trough and her face was close to it. She got splattered. Fortunately, she had on goggles. (816)

729. In Vermont, April 1986, my department chairman, a fifty-year-old male, pushed a large amount of sodium down a sink in the hood. He thought that it had completely oxidized by allowing the metal to be exposed to the air for several years!. When the water came in contact with the sodium it exploded. Fortunately, most of the hood was closed up. He only received burns on his arm and a couple of spots on his face. The hood was a mess. This happened while I was teaching a class in the room next to the lab. (829)

730. In 1963 in Catskill Central School, New York, a teacher was showing the reaction of sodium in water to produce hydrogen and sodium hydroxide. Either the teacher or the students wore no safety glasses or apron. The eighth graders were unimpressed with the reaction and pressed the teacher to add more sodium. The result was a severe explosion. Fortunately, no one was injured. (888)

731. In 1967, I put a very small piece of sodium metal into a large container of water. Due to rainy weather, I kept the students in the classroom for the demonstration. I usually take them out into the schoolyard. A fire started and covered the ceiling with soot. (904)

732. In 1971, Manchester High School, Manchester, CT. A student stole some sodium metal from a chemistry laboratory and hid it in his pants pocket. As he walked down the hall it began to burn his leg. An English teacher heard his screams, smothered the flames, and removed his clothing. The student was sent to the hospital. (911)

733. A second year science teacher threw a piece of sodium metal into a bucket of water causing an explosion which injured the teacher and blew apart a quarter inch thick etched glass "chalk board." Three pupils were injured, suits instituted and the teacher's contract was not renewed. He lost a week's work due to his injuries. No shielding or goggles were used. (916)

734. In 1985, a student was adding a small quantity of metallic sodium to an evaporating dish filled with water the student felt something bite him and then experienced a burning or stinging sensation.

All precautions had been followed: a small quantity of sodium, gloves and goggles were used as well using a glass plate as a shield. I had the student to take a shower. (931)

735. A college professor dropped a piece of sodium metal into water. The sodium reacted explosively and a piece of the sodium lodged in his eye. He went blind in that eye. (932)

736. In 1976, at a Junior High School, I was demonstrating the reactivity of sodium metal with water. I chose a large piece of sodium. Then I dropped the piece into a beaker of water. There was a terrific explosion. A girl in the front row stated that bits of glass were blown into her eyes. Fortunately, the nurse did not find any glass in her eyes. (957)

737. During a spring semester, 1986, at Adelphi University, a professor of Methods of Teaching Science Class asked our class of eight students a question relating to the most reactive metals on the periodic chart. We discussed the different groups. He showed us a bottle of sodium in turpentine and discussed the sodium's reactivity. He took out the chunk of sodium and placed it on the desk when suddenly the metal caught fire. Luckily, he was able to smother the flame before it got out of hand. (981)

Other cases include: 700

Sodium bicarbonate

738. When mixing baking soda and vinegar in a closed container, the top burst. Liquid was shot into the air. (897)

Other cases include: 632, 679, 756, 776, 777, 670, 885

Sodium carbonate

739. An IPS student at Salisbury School, Salisbury, Connecticut was preparing hydrogen and oxygen by electrolysis of a solution. Both electrodes were in the same test tube. A spark between the electrodes ignited the mixture. The test tube exploded. Fortunately, the student was wearing safety glasses. (875)

Sodium Hydroxide

740. In a quantitative analysis lab, the student across the bench from me was pipetting sodium hydroxide orally, no bulb. He ended up with a mouthful of strong base. (544)

741. Another student squirted a student with water from a squirt bottle. The second student squirted back. The bottle contained 0.1-molar sodium hydroxide. Luckily, no injuries resulted. Students were held after school, wrote signed and dated accounts.

Parents were called. Students were suspended from lab for the rest of that project. They were given a zero for that lab. (573)

742. A lab assistant spilled sodium hydroxide solution on her wool skirt. She was not wearing an apron or coat. No damage occurred, only financial loss. (612)

743. Working in a lab during a summer, a fellow worker pipetted sodium hydroxide solution by mouth. He received great damage to the inside of his mouth. He had to be fed by tube for many weeks after the accident. (613)

744. A girl spilled droplets of sodium hydroxide on her skin. She neglected to tell anyone or to wash it off. Hours later she went to the nurse. An area of her skin that looked as if she had been burned. (733)

745. In college, a student spilled sodium hydroxide on her clothes. She was hosed down. (772)

746. In 1986, in high school chemistry II AP class, a student had gone to the station where chemicals for the particular lab were being kept. He was getting some fairly concentrated sodium hydroxide. He collected his chemicals in a beaker and turned to go back to his place. Another student was standing behind him. As he turned, he bumped into the other student splashing sodium hydroxide into his own face. Luckily, he was wearing his goggles. We flushed with water and there was no damage. (777)

747. A high school sophomore (1979) ignored warnings to use a pipette filler when measuring quantities of Sodium hydroxide solution. When the instructor's back was turned he tried to pipet quickly using his mouth. While doing this, another student interrupted him. He lifted his head while still drawing up the solution. The solution went into his mouth. He gasped. The eyewash was used immediately to flush his mouth and his throat. The eyewash has a great force and large quantities of water can be used quickly. The result was only a few sores on his lips and the soft tissue in his mouth. (810)

748. In a high school chemistry lab a student heated a concentrated solution of sodium hydroxide too vigorously. The solution spattered and it burned the arms and face of the student and his lab partner. Goggles were on, thankfully. (924)

Other cases include: 549, 633, 670, 716, 718, 730, 838, 841, 979, 986

Sodium peroxide

749. Students were performing a chemistry lab using sodium peroxide. They were instructed not to discard the sodium peroxide in the wastebasket. One did and a wastebasket fire resulted. The fire extinguisher was directly over the wastebasket. (861)

750. A student stole some sodium peroxide after seeing how it reacts with water. He put it in some math paper and put it in his shirt pocket. Later in the day, it burst into flames.

This was early in my career and I trusted too much and was careless in surprising the students. (992)

Other cases include: 542

Sodium thiosulfate

751. A chemistry student was performing an experiment on heat of crystallization. This involved melting sodium thiosulfate in a hot water bath. The student used a clamp and clamped the tube onto the ring stand while the sodium thiosulfate was melting. After the experiment was completed, the student was remelting the chemical and set the test tube in the beaker without removing the clamp or attaching it to the ring stand. He stepped to the sink at the bench and the beaker, test tube and clamp fell to the bench then the floor. It scattered broken glassware and sodium thiosulfate all over. (860)

Sodium sulfide

752. I had students dispensing sodium sulfide solution at a dispensing table. One of the students dropped the 500 ml bottle. The fumes spread through the lab and it had to be evacuated. I made sure that I dispensed the chemicals in the future labs myself and did not allow the students to handle the dispensing bottles. (952)

Other cases include: 655

Sulfur

753. In 1986, a high school student was heating iron filings and sulfur in an attempt to make iron sulfides. She was using a test tube holder over a Bunsen burner. After the heating had been proceeding for about ten minutes her hand got tired and she attempted to change hands. In the process, the test tube was dropped and the contents splashed on her hands. She received a very bad burn to her little finger that took several weeks to heal and left a scar. The experiment should have been done with a ring stand and test tube clamp. (809)

Other cases include: 582, 651

Sulfur dioxide

754. I accidentally generated sulfur dioxide gas because the sulfuric acid bottle that I used was mislabeled as dilute instead of concentrated form. This happened in a high school classroom. The entire wing in the school had to be evacuated. (972)

Sulfuric acid

755. A bottle of concentrated sulfuric acid was stored in an obscure corner of the room. A fight broke out between two students and they knocked over the bottle. Luckily, the acid only affected the students' shoes and did not come in contact with their skin. (533)

756. A student spilled sulfuric acid on an apron and neglected to report the accident. He failed to clean the apron. The next student to use the apron, a girl, complained that her stockings were falling apart. Her legs were washed down with a sodium bicarbonate solution. The stockings were removed and her legs washed again with sodium bicarbonate. (502)

757. Students were working in the lab after school on a science fair chemistry projects. A student was starting to synthesize plastic. He was following a procedure (to the letter) from a copy of the Journal of Chemical Education. Among other reagents involved were concentrated sulfuric acid, glacial acetic, etc. A reagent was being added a drop at a time via glass tubing to open mouthed Erlenmeyer flasks. The flasks were wrapped in cloth based on the instructions given in the procedure. Because the reaction did not take place after a specified time, the student peered down into one of the flasks. At that instant, the reaction took place with a whoosh sound. A mixture of reagents and products pushed up out of the flask into his eyes.

At the hospital emergency room, the resident doctor literally was able to peel the formed plastic from one of his eyeballs. The happy ending was that the eye specialist judged that no permanent damage had been done to the eye. (541)

758. The laboratory storeroom temperature was kept too high. Liquids would often vaporize in containers. An undergraduate teaching assistant was opening a new bottle of concentrated sulfuric acid and the vapor pressure caused liquid to splash on his arms. He had goggles on and was working under the hood but the glass window was not all the way down and the acid splashed under it. It burned through the lab coat into his skin before he could wash it off. (542)

759. A student used a pipet to squirt concentrated sulfuric acid at another student because he didn't like him. The student's pants were eaten through and skin burns on his leg resulted. (550)

760. In a middle school, a student stirred some sulfuric acid with his finger. (559)

761. While rearranging the stock room I dropped a gallon of concentrated sulfuric acid on the slate floor. It shattered, splashing acid on my leg from the knee down. The

faucet was right outside the room and copious amounts of water saved my skin although my pants and shoes were gone.

To clean up, I used all the carbonate and bicarbonates I could find to neutralize and absorb. I then scooped it up and buried it in sand. Final mop up was with dilute sodium hydroxide solution. (992)

762. In a chemistry lab after school, a student was diluting concentrated sulfuric acid under direct supervision. He was correctly adding acid to the water. When he was finished, he carried the one and one-half liter concentrated acid bottle to the side bench. Because the density of acid is so much greater than water and because the bottle was correspondingly heavier than a similar bottle of water, the bottom of the bottle was held a little lower than the top of the bench. The bottom of the bottle sheared off in one piece covering the student with acid from belt to toes. Since this was before showers were in the classroom the student had to be taken to the gym, about 300 feet away. Fortunately, he did not sustain injuries. (588)

763. An instructor allowed his students to use concentrated sulfuric acid during a high school chemistry lab. A student assumed the container had water in it. He dropped it causing the sulfuric acid to spill all over the lab floor. The student had his clothes removed immediately and was showered. He did not receive severe burns. No one else was injured. Female faculty members cleaning up ruined their shoes. Their nylons dissolved just from the spatters. (616)

764. A college chemistry instructor was crippled. He had to use crutches. He was working alone in the lab one day. A bottle of concentrated sulfuric acid fell spilling the acid on the floor. His crutches slipped out from under him. He landed in the acid on his back. A janitor heard his screams and helped get him to a shower. The teacher was hospitalized for two to three weeks with burns from his neck to his shoes. (628)

765. My lab assistant was about to wash the glassware. The sink was full of beakers. He held a beaker under the faucet and turned the water on. The full force faucet caused the water to splash up and sprinkle on his face. The wet spots on his face concerned him.

I asked him if there was anything in the beaker when he picked it up. He thought there might have been a little clear liquid. There was the possibility of sulfuric acid since I had used some of this chemical. I had him flush his face and then sent him to the hospital for eye treatment.

This resulted in detailed precautions of how to hold a beaker under the faucet. (641)

766. During a lab, a high school chemistry student mixed concentrated sulfuric acid and water incorrectly, even after having been taught the correct procedure. The solution immediately boiled and splattered out of the beaker, and went all over his arm, which was covered by a sweater. The arm of the sweater disintegrated. (643)

767. During the preparation of carbon dioxide for volumetric determination, a student did not add water to marble chips used in the generator. When the concentrated sulfuric acid was added the reaction was violent and moved rapidly through the calcium chloride drying tube. His quick mentioning to me what had happened helped me to act fast. I stopped the reaction by flushing it with water in a nearby sink. (657)

768. Bottles of sulfuric acid were stored on the shelves that were constructed of boards and brackets. The brackets corroded and there was an acid spill. The university fire department was called to clean it up. (687)

769. I heated water in a beaker on a ring stand in the lab area to make coffee. I picked up the wrong beaker. It was diluted sulfuric acid. Fortunately, the acid was further diluted when I added more water to it. I tasted the acid immediately. I took several Alka-Seltzer tablets and drank a solution that the chemistry teacher made up. There were no lasting effects. Fortunately, no one was injured. (724)

770. A girl went to dump a test tube of sulfuric acid down the drain. She accidentally hit the faucet and spilled the acid on her hand. It blistered immediately. I put it under water and I sent her to the emergency room. She had some scars for a few weeks. All healed nicely. (746)

771. In a thermite reaction demonstration powdered aluminum and ferric oxide mixture was placed in a paper filter cone. Potassium chlorate and sugar mixture was placed on top. Concentrated sulfuric acid was used to "ignite" the mixture. When the reaction takes place, there are some sparks that fly around. Unfortunately, I had placed the beaker with the potassium chlorate/sugar mixture nearby. One of the sparks landed in the mixture and the entire contents then proceeded to burn with a pretty, purple flame. (751)

772. A teaching assistant who was a nun and wearing the long black habit was lifting a large five-liter bottle of concentrated sulfuric acid and dropped it at her feet. The bottle broke. The habit actually hindered her safety as it absorbed the acid and held it to her legs and feet. Although she was aided quickly, she was impaired for several years and still has scars. (753)

773. During the mid-sixties I was working in a Nuclear Medicine Laboratory. I was making up a glassware cleaning solution. The solution was a mixture of dichromate and sulfuric acid. I was using gloves. But, some how I spilled the acid on my lab coat. It ate through my coat and tie.
(759)

774. Several years ago, a junior high school teacher who had many years of experience reached up on a high shelf to get a gallon bottle of concentrated sulfuric acid. As she stepped back to turn around, her foot slipped on a wet spot on the storeroom floor. She fell dropping the bottle. The bottle broke and splattered her thoroughly. Luckily, another teacher nearby heard her cry out, rushed into the

storeroom, stripped off her clothing and put her into the safety shower. She spent weeks in the hospital with serious burns. She has permanent scarring. (769)

775. During the spring of 1985, students were studying redox reactions. The lab required that they heat the reaction mixture in a test tube. One of the reagents was concentrated sulfuric acid. An eleventh grade student pointed the test tube at himself and it erupted. Immediately, his lab partner poured water all over him. After much dilution the student was then sent to the school nurse. The lab area was cleaned up. No serious injury resulted. He did have goggles on but no apron. Instruction for proper heating techniques had been given. (787)

776. In the early eighties in Waltham, Massachusetts, my work involved testing of low-level metals. Because of this, we had to clean all our glassware with a mixture of hydrochloric, nitric, and sulfuric acids. We would clean the glassware with soap and water, then let them soak in the acid bath. One day, while in a hurry, I mixed the three acids in the hood in a one liter plastic bottle. I was not wearing gloves. But, I did have safety goggles on. I mixed the three acids and capped the bottle. Later in the day, I opened the bottle again. Pressure had built inside the bottle and the acid sprayed all over the hood, my hands, my lab coat and my face. I had on two gold rings, which turned a copper color. I immediately ran to the sink and rinsed my hands with water then sodium bicarbonate. I was very lucky. I don't know why my hands are not permanently scarred. I did learn to never work in the lab when in a hurry and to always wear safety equipment. (807)

777. In 1950, New York City, during college organic chemistry lab, students were performing a reaction using the hood. The directions were to add one to two milliliters of concentrated sulfuric acid. One of my classmates' reactions did not start. So, she added 20 ml of concentrate sulfuric acid. Still, there was no reaction. I suggested she speak to the chemistry instructor who was sitting in his office reading. Before he could come into the lab her experiment exploded. Chemicals splashed over me. The other students had the presence of mind to take sodium bicarbonate solution and pour it on me. My lab coat, stockings, skirt and blouse disintegrated. I had to return home at rush hour on the New York subway wearing a lab coat. (840)

778. In the spring of 1981 in New York, sugar and sulfuric acid were mixed in a wide mouth flask at a safe distance from the class. After one minute had elapsed an explosion occurred. There was no "safety shield." Paste showered students. Minor burns resulted but no glass injury was reported. (912)

779. An attractive 17 year old, twelfth grade student in Pensacola, Florida Chemistry II class, was doing the lab wearing her cheerleader uniform.

The student was working at her lab station when she hit a graduated cylinder containing sulfuric acid (diluted) with her elbow and spilled it on herself. She knocked the acid container over with her right arm. Parts of her body were disfigured, i.e. the injury included acid burns on the left arm, thigh and leg). The teacher was not wearing gloves, goggles or an apron.

She was place under the shower located within two feet of the lab station for approximately five minutes. Then, a slurry of sodium bicarbonate was poured over affected areas and she remained under the shower for at least an additional five minutes.

The student's chemistry teacher and the assistant principal escorted her to the hospital. A hospital staff person notified her father by phone.

The school district was being sued for damages and alleged:

Count I Negligence (Excerpts ONLY)

5. The entire chemistry program was so negligently operated, planned, and maintained that Plaintiff, (the student), was seriously burned by concentrated sulfuric acid. The errors and omissions of Defendant, School Board, and its agents included, but were not limited to, the following:
   A. Failure to provide adequate protective clothing.
   B. Failure to follow established safety guidelines for the handling of concentrated sulfuric acid.
   C. Failure to provide adequate safety training.
   D. Failure to provide adequate and necessary supervision.
   E. Failure to follow proper and safe laboratory procedure.

Count I Dangerous Conditions (Excerpts ONLY)

7. At the time and place aforesaid, there was a dangerous condition on the premises; to wit, concentrated sulfuric acid.
8. The aforesaid condition was not properly guarded, not properly warned against, nor was it necessary for the teaching of chemistry; safer alternatives being available.
9. The condition was either caused by Defendant or its agents or had existed long enough so that they should have known about it.
10. As a consequence of the condition aforesaid, Plaintiff suffered bodily injury and resulting pain and suffering, disability, disfigurement, mental anguish, loss of capacity for the enjoyment of life, expense of hospitalization, medical and nursing care and treatment, loss of earnings, and loss of ability to earn money. The losses are either permanent or continuing and Plaintiff will suffer the losses in the future.

This is the first serious litigated science incident this school district has encountered in over ten (10) years. The student's parent DID NOT try to resolve the problem with school district officials or the school district insurance carrier.

The evidence indicates that the student's partner told her to be careful prior to the occurrence of this incident. Neither she nor her teacher wore a lab apron, glove or goggles. During the deposition, which was three (3) years later she COULD NOT identify the acid.

The case was reserved at $40,000,00, including defense cost at $10,000 (calculated estimation of monetary exposure.)

POSSIBLE PREVENTION MEASURES:

1. Prohibit the wearing of improper clothing in a chemistry lab.
2. Written safety procedures posted.
3. Student(s) should have been required to wear an apron(s) if attired in improper clothing.
4. The teacher should reiterate selected safety procedures during pre-lab.
5. Safety test administered by teacher.
6. Documentation by teacher of safety instructions given to students.
7. Hindsight. (956)

The out-of-court settlement was around $35,000.

780. During graduate school while working on my master's thesis I was pipetting concentrated sulfuric acid from a flask into various beakers. While pipetting over my lap I dropped the pipette through the flask and acid poured onto my lap. (966)

Other cases include: 637, 670, 754, 902, 938

Tar

781. Walking from the hotel in Mexico City, I felt something hot. Workmen on the roof were pouring tar material that somehow landed on me. (692)

Toluene

782. I was performing an organic synthesis in my undergraduate lab. The synthesis required using toluene as a solvent. I heated the apparatus with proper cautions. I reached to a point in the synthesis, which required addition of other reagents. This step required cooling the apparatus and turning off the Bunsen burner. I chose instead to move two or three feet away and open the round bottom flask to add chemicals without cooling or turning off the Bunsen burner. Toluene is volatile at room temperature but even more so at the increased temperature. The vapors spread across the lab bench and ignited, reaching the flask in my hand. Fortunately, only first degree burns and embarrassment resulted. The fire was quickly put out with an asbestos pad covering the flask. (893)

Other cases include: 987

Electricity

783. I work in a room shared by another teacher. The other teacher had been using plaster of Paris to make casts of fossils from clay molds. Someone had put plaster into an electrical outlet. The plaster had then solidified. My class had been doing an activity that involved the use of scissors. A student apparently was poking at the covered outlet

with the scissors just prior to clean up. The tip of the scissors broke through the plaster and the student was shocked jolting him from his metal stool. The student tried to retrieve the scissors and was jolted again, knocking him to the floor. He was taken to the hospital where he was treated. He continued therapy for several days. When he returned, he walked with a limp because his legs had been wrapped around the legs of the stool. (510)

784. A student stuck his forceps in an electrical outlet. He didn't think the outlet was live. Luckily, he only blew a fuse. (549)

785. During my first year of teaching, I was demonstrating to another person the difference between a series and a parallel circuit. Talking as I went along, I disconnected the metal rods with two hands. The rods were not covered. Electricity flowed through me. (591)

786. An appliance distributor delivered and wired a 220-volt electrical dryer. The installer incorrectly wired the appliance line cord to the terminal strip inside the dryer so that 110 volts appeared on the unit's exterior cabinet. The paint on the device effectively insulated the user for three months. By accident I happened to be walking by the dryer with a #10 ground wire. This uninsulated wire was to be connected to some nearby radio transmitting equipment. The wire lightly brushed against a screw on a recessed panel at the bottom of the cabinet. The wire was instantly welded to the screw. The resulting current draw blew one 60-amp cartridge fuse and knocked out half of the electrical service to the house. (690)

787. A student sitting at a lab table started to pull the faceplate off the receptacle at the desk. By putting some object into the exposed receptacle, he created a large spark that came out of the desk very close to him. It was a case of idle hands during a class. Since this time, we have reduced the use of labs for classes (non-lab instruction). (879)

788. A teacher left a heat lamp on to warm a terrarium. The heat lamp was near a bulletin board and the cord was wrapped around the base of the lamp. A short occurred and the papers on the bulletin were set ablaze. The Saturday watchman put out the fire in time. (88)

789. A physics teacher, inexperienced with American high school students, told the class not to fool around, and then left a group of senior boys with a power pack and several leads having alligator clamps. One of the students in investigating what the pack could do, grasped the lead by the metal clamp, obtaining a nasty electrical burn and scaring the other students. Fortunately, the accident was no worse than this, though it tended to grow with the retelling. (949)

790. A student was doing an electrical experiment working with 120 V AC. He wanted to know what would happen if he connected the red and black wires while he held the bare ends of the wires. I stopped him in time. (964)

791. In August 1987, my husband and I were inside a garage. Some vines had grown into the garage and wrapped around the lighting fixture wires. A man outside the garage was pulling the vines off the garage one by one. He was using a great deal of force and could not see the potential hazard. We cut the vines from the inside so he wouldn't pull down the wires. (977)

792. In the 1984-85 school year, a biology teacher had to deal with equipment that had not been checked thoroughly. A wall receptacle was part of a track system. The whole thing was loose and various other receptacles did not work. The teacher went to pull out the plug on a microscope. There was a large explosion. She received a bad burn on her hand that required emergency room treatment. (846)

793. A technician reached to turn off a blender. He was knocked three or four feet across the lab when he touched the blender. It shorted. (545)

794. A student plugged in a microscope and the lamp (Swift 900 series) exploded scarring the student and making other students uncomfortable about using anything electrical.

Previous students had wrapped the cord too tightly. The soldered connection in the lamp housing short-circuited, clearly a design flaw in a widely used microscope. (581)

795. A high school sophomore was working in a lab. The lab was designed with electrical outlets at student desk level. A student put his spiral notebook on the desk and the loose metal end went into the live outlet. The circuit blew before anyone was injured. A portion of the spiral was melted. (623)

796. A former teacher at our school went to turn the geyser lights on with a light switch key. She really got zapped out cold for a while. She had put the key into a faulty receptacle.

Periodic maintenance checks might have prevented this. (675)

Other cases include: 589, 614, 662, 949, 975

Fire extinguisher

797. While cooking in a fry pan, I wanted to remove it from the stove. I used a potholder with some printing on it. The lettering stuck to the pan. I returned the pan to the burner and a fire occurred where the lettering stuck to the pan. Luckily, I had an extinguisher nearby. (743)

798. I was heating a water bath in a beaker on a ring stand too close to a pegboard in an IPS class. The board started to smoke and then broke out in flames. A nearby extinguisher saved the day. (747)

799. A special education student, roaming the halls and skipping class, ran into a 48 member seventh grade Life Science Class. Students were seated all over the room, at the back, etc. The Special Ed. student yelled a remark to the class, a reply was immediately forthcoming. At that point, the Special Ed. student grabbed the fire extinguisher and shot it at a girl's face. She had irritations of the face and eyes that required medical attention. (779)

800. In the 1970's, I was demonstrating chemical fire extinguisher to my seventh graders. The rubber tubing that was connected to the metal nozzle popped off and the chemicals spewed into the room while I was holding the rubber tubing. . It must be inverted to allow acid and chemical to mix and begin reaction. (975)

Other cases include: 544, 561, 579, 602, 652, 661, 698, 749

Flask

801. In a high school Regents Chemistry, lab a student heated a closed flask. The stopper did not release and the flask exploded. Fortunately, no serious injuries resulted. (973)

802. A Florence flask that contained a rubber stopper half way down the glass neck was submitted to the chemistry teacher. After school, the flask was set on a tripod and wire gauze and heated to blow out the stopper. The flask exploded just after the teacher left the prep room for a second. No one was injured. (994)

Other cases include: 821, 843, 852, 979

Glass

803. After listening a "thousand times" to the proper way to insert a glass rod into a cork, a student inserted a glass rod into (and through) her hand. No glycerin or hand protection was used.

The glass rod was pulled out before I arrived. I applied pressure with a cloth and walked the student down to the nurse. (513)

804. In a biology lab, an aquarium was sitting on a lab table next to the lecture area. Without warning, the tank ruptured, spewing glass and water on the students sitting near by. Luckily, there were no injuries, only soaking wet students who were sent home to change clothes. (515)

805. When heating a glass rod to make a stirring rod, a student, instead of pressing down with his thumb on top, held it in his hand at a 45-degree angle while pressing. The tube broke in half, and punctured the index finger and cut the top of his hand. (534)

806. A class of 26 students included three who had eyes so blood shot you could see "road maps" in their eyeballs. The class was shown how to cut glass tubing and several students were even individually guided in methodology by the instructor until he felt that all knew how to cut glass. Then he showed them how to fire polish and bend glass. At the end of the instructions, he told the students to start their experiments.

Within seconds one of the students' approached him with a smile. He said, "I believe I have a problem" as he pressed on his bleeding palm. The other side of the hand also seemed cut. The glass tube had gone through the palm of his hand. No toweling was used when snapping the tube. The instructor sent the student to the nurse with a compress on the cut. A few minutes later his partner came up with the same problem; however, he didn't have any glass penetration through his palm.

I remarked to the class how pleased I was that they had remained calm through the event. To my amazement, I discovered they believed the event was part of my demonstration. (575)

807. I was using a bell jar and a vacuum pump. Vaseline was on the bottom of the jar to aid in creating a seal. This made it quite slippery. I broke the bell jar and the glass sliced my hand. (590)

808. The microscope cart had glass sides. One of the sides was broken. In reaching over the cart to open a window, a boy cut his arm. (594)

809. In trying to put a stopper on the tube, the glass broke and the push force was adequate enough to pierce and go all the way through the palm. (596)

810. In a department store a customer walked through a plate glass window instead of the door. She received severe cuts requiring stitches. Now, there are warnings striped on the window. (614)

811. I was teaching astronomy and demonstrating the phases of the moon. They began on a lab to mimic this process. Each student was given a light bulb/globe set up on lab benches. Everything was going smoothly. When suddenly a light bulb exploded sending glass chips everywhere.

No one was injured. How can this be prevented? This happened while my principal was observing me! (652)

812. While explaining and demonstrating how to insert glass tubing into a stopper the teacher was talking to students, answering questions and showing how not to force the glass into the stopper. A student spoke out, the teacher looked up and pushed real hard breaking the tube. The broken end penetrated the flesh and blood squirted out of the glass tube. Realizing what had happened, the teacher called for the nurse to take her to the emergency center. This happened at 10:30 AM. At 8:30 PM they finally removed the glass tube. (676)

813. As a graduate student I was supervising a freshman, nursing lab. A girl put a glass rod through her hand. She was bleeding badly and was very frightened. School

policy required that a security guard drive her to a hospital. She needed support, as this was her first time away from home. She lost the use of her thumb and forefinger for one year. She needed extensive neurosurgery but finally regained their use. (742)

814. In an IPS class a boy pushed a piece of glass tubing into a rubber cork without lubricating it. The tube broke and caused a severe cut. (745)

815. A student was attempting to place a glass tube into a one-hole stopper. He held the stopper in one hand and the glass tube in the other. There was a six-inch gap between the stopper and the hand. The student tried to push the tube into the hole. The glass tube snapped halfway and the jagged end went through his hand that was holding the stopper. (750)

816. In putting glass tubing into the hole of a stopper, Vaseline was not used. The result was a broken tube and a severe cut. (784)

817. In a 1977, during an IPS lab (mass of a gas experiment), brand new pressure bottles were being used. The teacher had visually examined them for defects. One-quarter Alka Seltzer tablet was placed in about 10 cc water. About fifteen seconds later the bottle violently exploded. There was glass over the entire room. A student was hit in the face with a fragment of glass. It just missed his eye. From now on, all students wear goggles. (818)

818. In 1987 my chemical stockroom assistant was inserting a condenser tube into a water jacket through rubber washers. The top part of the condenser tube fractured. Jagged glass edges tore through the protective toweling into two fingers. There was profuse bleeding. He was taken to the emergency room and stitches were required to close the wound. All the slivers were not removed the first time. Several months later he still had swelling in his fingers and had to return to the hospital to have the remainder removed. (824)

819. In 1987, a student was cleaning up at the end of the lab. A beaker started to fall off the bench and the student grabbed for the empty beaker, smashing it against the bench. He cut his hand deeply in two places and may lose some feeling in his fingers. (901)

820. In 1986, Newtown High School, while using the top of ripple tanks, a student leaned on top of the glass and it broke. Luckily only slight scratches occurred. (922)

821. In 1973, an eighth grade general science demonstration involved making a cloud. The apparatus used included: 2000 ml flask, one hole rubber stopper with glass tubing, chalk dust, warm water, pump to create a higher pressure.

Students all gathered around the demonstration table and the flask was connected to the exhaust part of the vacuum pump via a rubber tube. While I was holding the top of the flask with both hands and creating a higher pressure the flask exploded sending glass fragments to all corners of the room. I received multiple cuts

on my hands. Only one student received an injury that required medical attention. He needed a stitch for a cut between his eyes. (941)

822. One of our students in Lafayette, LA, was heating and bending glass. He grabbed the bent glass tubing at the bend when it was still hot. This, of course, caused a burn. (953)

823. In Milford, Connecticut during the distillation of alcohol/water mixture, a student was inattentive and allowed the mixture to overheat. It popped the stopper, boiled over and burned. Due to overcrowding of the lab, the resulting commotion caused broken glass and one minor cut. (867)

Other cases include: 542, 649, 714,717, 725, 733, 736, 751, 778, 827, 860, 891, 901, 903, 932, 942, 960, 961, 963, 964, 965, 966, 967, 968, 969, 971, 972, 973, 977, 988, 903

Glove

824. Junior high students invariably burn their fingers while bending glass rods. Gloves would prevent this. (980)

Other cases include: 574, 633, 634, 698, 773

Goggle

825. In an eleventh grade welding shop class, a boy had removed his goggles to remove hot slag from the area. A piece of slag flew in his eye. The shop teacher sent him to me with another student. By the time I saw him, he could barely open his eye. When I tried to use the eyewash on him he became ill, vomited and nearly passed out. Ten minutes later, the shop teacher finally showed up with the principal. By then, I had rinsed his eye twice and had the other student steady him on the chair with a cool compress on his head.

This happened within the first month during my first year of teaching. I was scared to death. (506)

826. I was shaking a can of paint stripper to mix it. I set the can on the workbench and unscrewed the lid. The material erupted and hit my eyes. No goggles were being worn. (547)

827. I was opening a glass container. The top froze momentarily. With increased pull, the top jerked off and the liquid, a test solution for a bacteriological procedure, splashed into my eye. At that time, there was no eyewash. So, I had to hold my eye under a faucet. Fortunately, this was in a medical complex and an eye doctor was available.

The eye injury was very painful for several days but no permanent damage was received.

This occurred about 10 years ago and I had never been told about goggles in school. (562)

828. This accident happened to a graduate student who had very sloppy techniques in the lab. He had to make an acid solution. He poured water into the concentrated acid. As a result, the solution blew up and spattered all over him. He was lucky just to have the clothes he was wearing covered with the acid. He was not wearing goggles or an apron. (570)

829. In my college organic lab during preparation of a blue dye, a student down the lab bench was heating her caustic solution in a test tube without proper movement. The solution shot out of the test-tube about 5 feet and hit me in the face. No goggles were required "back in the dark ages." However, my prescription glasses kept the solution out of my eyes. I suffered minor facial burns. (578)

830. In a biology lab, formalin had been injected into a specimen as a preservative. When the student cut open the specimen with his face close to the dissecting pan, fluid under pressure exploded into the student's eyes. (606)

831. A very bright senior high student wanted to make rocket fuel. He asked his teacher if he could melt potassium chlorate and mix powdered sugar in it. The teacher spent over an hour trying to convince him that there was no way that the experiment could be done safely.

The student was one of the “brightest” students in the school and had permission to work in a room just off the science office. There was a large window between the two rooms. The student tried the experiment and was stirring the sugar into the molten potassium chlorate with a thermometer when it flared up in a huge flame. A teacher from the science office was at his side immediately and walked him to the nurse. He was quickly taken to the hospital and treated for severe burns on his hands and face. Part of his hair was burned off. He had permanent damage to his hand. The only good thing was that he was wearing goggles and suffered no injury to his eyes. (617)

832. At the University of Newcastle Upon Tyne, England in 1975, a fellow undergraduate received injury to her eyes during an experiment. A few of us were in a large lab with long benches with fume hoods around the outside of the lab. One student was doing work in the hood refluxing some chemicals. About fifty feet away, a girl was recrystallizing her product using ether in a watch glass. The dense vapors spread along the bench and a roaring rush of flame spread the full length and hit her in the face. She was not wearing goggles. (815)

833. A tube was being heated with a Bunsen burner while attached to a ring stand. The tube fell and the solution belched out just as a student walked into the line of projection. It hit the student in the upper forehead and on his face. He was wearing goggles but

the solution ran down into his eyes and face. (He was wearing the wrong type of goggles.)

The student immediately splashed water over his face and eyes. As a result, his face was stained brown from the protein. He had discolored skin for two to three days. The dead cells sloughed off. Luckily there was no eye damage.

Now, we only use hot water baths on hot plate. This experience proved to be a dramatic scare that reminds incoming students to be even more careful. I will not allow students to use phenol with melons. The parents recognized that we had taught proper response to eye splashes and the student acted immediately. However, the eyewash station was not close enough and the bench water faucet had to be first used. There is an obvious need for a different style goggle. (621)

834. A high school senior was using an eyedropper to stir a strongly basic solution. He pressed on the bulb and splashed the basic solution out of the evaporating dish onto his face. He had slight burns on his face but goggles protected his eyes. (622)

835. A high school junior was experimenting with making some alloys for a science fair project. He wanted to determine the temperature of the molten alloy. He inserted a mercury thermometer in the alloy. It exploded spattering some of the alloy in his eye. Fortunately, it did not affect his vision. He was not wearing safety goggles. He was lucky. (629)

836. In an IPS class, students were using potassium dichromate in a solubility experiment. The lab was over and goggles were off. A student rubbed his eye and he got a crystal in his eye. We began flushing and called the nurse. She compounded the problem when she insisted on sending the student to the emergency room without a longer flushing period. Student wore an eye patch for a month. (705)

837. I was demonstrating the properties of silicon as a metalloid. To show its brittleness, I hit it with a hammer. I must have come down with extra force and a small piece went flying. It hit a student in the second row. This incident pointed out to me that goggles are necessary even during demonstrations and not just during lab activities. (722)

838. In 1964, seniors were making methane according to lab manual instructions. A student arrived thirty minutes late to the lab. She decided to watch another student's experiment instead of performing it herself. She did not put on goggles or apron.

For some reason (to this day undetermined), pressure built up in the test tube and the cork and all contents exploded from the end of the tube. One of the contents was sodium hydroxide. As the contents splattered around the lab table two girls were splashed lightly in the face with the contents. The student who was watching got the contents full in the face. Her contact lenses saved her face.

Twenty years later she was still having plastic surgery. I was one of those seniors. (767)

839. In 1987, a biology teacher was demonstrating a technique for dissecting a clam for a high school biology class prior to the student's dissection lab. A piece of tissue from the clam flipped into her eye because she was not wearing goggles. It burned her eye to the point that the ophthalmologist treated and bandaged it for two days. Now, we require all students to wear goggles when dissecting. (794)

840. In 1986, an eighteen-year-old high school student was working part time in a local industrial lab. Her job was to wash dishes. An unmarked, closed plastic container exploded when it was uncapped in dishwater. It blew a strong base into her eyes, on her arm and hand. Even though she had received instruction at school on the necessity of wearing goggles she chose not to wear them because the other workers never wore their goggles and she didn't want to be different.

She had second-degree burns on her arm and hand. Her eye was saved. (796)

841. In 1980, in Smithtown, New York, a high school junior in was doing a chromate/dichromate equilibrium lab. The teacher did not require goggles because the experiment involved only small amount of reagents. They were using Potassium chromate, dichromate, Sodium hydroxide, hydrochloric acid, and Barium nitrate.

The student was holding a 10x100mm test tube in his hand about two feet above the lab counter. The tube probably contained a one-milliliter mixture of the above materials. The test-tube slipped from his hand, hit the lab counter but did not break. Instead the liquid reversed direction and went directly into his eye. The eyewash was used, he was sent to the nurse and to the emergency room at the hospital. There was no injury. (834)

842. In 1975, in a Connecticut public school, an eighth grader applied direct heat to an alcohol thermometer. It exploded and glass flew into his eyes. His goggles were on top of his head. (884)

843. In 1984, I was demonstrating the relationship between the pressure and the boiling point of water. I initially heated the water in a flask with a one-hole stopper with a thermometer in it. Then I cooled the water under a trickle of cool water. There was a small crack in the flask and there was an implosion from the vacuum created. Glass went everywhere. I had my goggles on. The students did not. Fortunately, the students were far enough away. Now, when I run this demonstration, I carefully check the flask for cracks. I tape the flask and all students wear goggles. (887)

844. In 1985 at Wesleyan University in a graduate chemistry lab, a vacuum hose clamp pushed off and flew into a student's eye. (926)

845. In 1956, New Hampshire, in a high school chemistry class, were preparing hydrogen gas by placing mossy zinc in a test tube and then adding dilute hydrochloric acid. The instructor had explained the need to leave the test tube unstoppered. A student stoppered the test tube. The gas pressure increased. The stopper blew out of the tube splashing the student's face with the corrosive mixture.

The response was to wash the face with our eyewash for ten minutes then send the student to the nurse who continued the process. The student was then sent to the hospital where no injuries were discovered. Accident reports were filled out.

No eye protection was used. The rule had been neglected and, complicating the situation, the instructor was not involved. (940)

Other cases include: 706, 714, 716, 727, 728, 733, 734, 746, 747, 748, 758, 775, 776, 817, 918

Hair

846. A high school student came in after school to make up a missed lab. The lab did not require a partner, although his partner was present. The teacher was across the room from her workstation and looked up. He saw the students' hair catch fire unknown to her. The teacher called to the partner who immediately extinguished the fire by brushing her hair.

If partner was not close by, the student might have panicked and freeze. The time it would have taken for the teacher to reach the student was sufficient for flames to have done serious harm. (618)

847. In a biology lab, students were using burners. They were instructed to shut them off as soon as they were finished. Student "X" complied then realized he had to do one more step and relit his burner. He then leaned over it to pick up a piece of apparatus, igniting his hair. The student next to him had the presence of mind to put down his working and bare handed snuffed out the fire. (667)

848. Hair with hair spray caught on fire. It was a puffy bangs hairdo. I put it out with my hand as I was very close. She was ok, so was I, but very frightened. (741)

849. A female university microbiology student with a light, poofey hairspray covered hairdo leaned over the flame of a Bunsen burner. Her hair caught fire. Another student dropped his jacket over her head to extinguish the flames. No skin burns occurred, just a new haircut! (774)

850. My eighth grade students were learning how to use Bunsen burners. A young girl approached me to say that she could not get her burner to ignite. I went to her workplace and adjusted the burner without ever checking the gas jet. I struck a match and a flame leaped out at me. I turned my face to protect it but my waist length hair (that should have been tied back) started to burn. A student smothered the flame in my hair as I reached to turn off the gas jet. (800)

851. In 1971, Coventry, Connecticut, A girl's long hair caught fire while working near a Bunsen burner. She characteristically tossed her head and hair around as she worked. Loose hair went through the flame. She wore goggles. I caught her by the head and put her hair in the nearby running water. There was no severe damage.

I now have high-powered hoses that can "hit" with force anyone in the class. (869)

Other cases include: 515, 523, 527, 532, 613, 642, 691

Heating mantle

852. A graduate student working alone at Georgia Tech was synthesizing an organic compound under a hood. He placed a round bottom flask containing the preparatory mixture in a heating mantle and left the lab. He came back a while later to check the mixture and realized he had heated it too long and too vigorously. While attempting to remove the flask from the mantle, the mixture exploded. Glass flew into his face. He was severely cut and burned. He was in the hospital for a few weeks. Fortunately he was wearing safety glasses and a lab coat. (950)

Hot plate

853. The science class used hot plates to heat water during an experiment. The hot plates were too hot to put away and were left out. Students from the next class came in. One student touched a plate and burned his hand and fingers. (979)

Other cases include: 591, 604, 854

Hot water

854. A student was heating water for a hot water bath on a hot plate. The student turned around, catching the cord and the hot water spilled on her leg causing a bad burn. The teacher pulled down her jeans and put paper towels of cold water on the burn while another student went for ice and the school nurse.

The electric sockets were below the table top, on the side of the table. (512)

855. In 1980, Waterbury, Connecticut High School, a physics student was boiling water for heat transfer experiment. She was rather short and stood on tiptoes to read the thermometer. She pulled the thermometer down against the edge of the beaker and pulled boiling water on herself. Luckily, the damage was limited. (902)

856. In a high school lab, a male student in physics was boiling water in a beaker. The beaker broke and boiling water spilled all over. (963)

Improper behavior

857. During my first year of teaching, I was demonstrating to general science students how to make alcohol from sugar. I discussed the fermentation process as well as identification and purification procedures.
After two weeks on the project, students were to turn in their completed product. One student decided to guzzle down 300cc of nearly 200 proof alcohol instead of turning it in.

I was petrified as I was sure it would kill him. I took him to the water fountain and forced him to vomit until I was sure he was safe. I then made him drink two containers of milk and took him to the principal. (718)

858. In 1984, a company that used a variety of chemicals in order to produce "boards" was expanding and updating its laboratory and storage facilities. Workers who were responsible for renovation had relatively free access to the halls in the lab area. One such worker paid no attention to the "No Smoking" and "No Admittance by Unauthorized Personnel" signs. He walked into a storage area, tossed a lit butt and caused an explosion. It was lunch time so few people were around except for a chemist who grabbed the man away from the fire, shoved him under the nearest shower and ran to pull the fire alarm. Since the construction wasn't finished, the automatic alarms didn't go off. Others heard the chemist's screams and ran in with fire extinguishers until fire department arrived. (851)

859. A biochemistry lab involved, amino acid sequencing of a protein. Students were warned that they were working with toxic reagents and to use care. One of the compounds in use had been premeasured by the lab assistant and placed in small containers. A student was joking and intended to pretend to drink the reagent. Unfortunately, he really drank the reagent. He was sent to the infirmary. The incident apparently did no immediate harm to the student. (857)

860. In Danville, Vermont, a male student was aggressive in his behavior. During counter clean up with a sponge he cleaned so vigorously that he smashed a glass Pyrex beaker against the back of the counter and cut his hand. Students with this type of behavior should not be allowed in lab situations. (896)

861. In Connecticut, Newtown High School, a student was not careful on how she was sitting on a high lab stool. The stool tipped over and the student fell hitting the ground with great force. (910)

862. In May 1975, my eighth grade honors class was having a lab activity that included building electromagnets and determining methods of increasing their strength. One of the students placed one of the D cell batteries in his left hand and a scissors in his right hand. He placed the scissors in the outlet! "Why?" I asked him. He said, “he wanted to recharge the battery!” (958)

863. In the shop department of our school, a boy threw a piece of wood to another whom, when he grabbed for it, cut off two fingers on the table saw. His teacher

grabbed the fingers and the boy, threw him into the car and had him at the hospital within five minutes. The boy's fingers were rejoined. (984)

Improper cleaning

864. In the early evening, smoke started to come from a wall behind the wood stove. The fire department was called. After we put out the smoldering fire, we found that in haste, the outside chimney had never been cleaned out and the soot had built up to the stove pipe. It started to burn the wall. The wall behind the stove was made of wood with a thin layer of paneling. If the fire had started in the middle of the evening, who knows what would have happened. (714)

865. A previous instructor had been working with acids on the lab table and had only partially wiped it up. I sat on the table while lecturing and was unaware of the effects until the seat of my pants decomposed. (971)

Improper disposal

866. I was a college student. During an organic lab, I wanted to get rid of some chlorosulfonic acid. I poured it down the sink and it violently splattered back at me. I still have two scars on my chin from the acid burns. (660)

867. A graduate student collected waste in a common waste container without keeping careful records of what was going into it or without the proper chemical knowledge to worry about it or both. A small explosion and fire occurred. (688)

868. During an eighth grade science lab, I lit a Bunsen burner with a match. I discarded the match into a Styrofoam cup that I thought had water in it. The cup wound up in flames. The cup was empty. Fortunately, it was next to a sink and was quickly extinguished. (737)

869. A woman was getting rid of hair spray from an aerosol can. She sprayed it into the toilet bowl. She did not flush the water and hair spray. Her husband came home, took his newspaper and cigar into the bathroom, sat down, lit his cigar and threw the match into the bowl. He jumped up with the flame falling into the tub and broke his leg. A true story. (744)

870. In 1970, in a college organic chemistry lab, after the instructor left the room a student began doing his own experiment. He combined chemicals to form a very unstable compound. He said he was aware of what he was doing. He inadvertently spilled the liquid compound. Clean up became explosive when it came in contact with anything. Towels were disposed of in the trashcan that resulted in a small explosion that was large enough to cause the instructor to return. (828)

871. Students were in a regular classroom lab using a dropper to dispense minute quantities of concentrated acids. Apparently, one student spilled a small amount of acid and told no one. He did not wipe up the spill. Later on, a girl wearing a blousing with oversized sleeves soaked up some of the spill. The fabric came in contact with her skin and stuck there. The girl thought her sleeve was just wet with water. But, soon a burning sensation alerted her to the problem. Flushing and neutralization along with a visit to the nurse minimized the injury. There was no permanent scarring. (845)

872. Milford, Connecticut, hot potassium chlorate was dumped into the paper trashcan. It burst into flames. Luckily, there was no bodily injury. (866)

873. In 1964, a student put a burned out but hot match into a wastebasket which had a paper towel with Carbon tetrachloride on it. There was a bucket fire. It was easily extinguished. (903)

874. In 1980, Cairo Durham High School, chemicals used to create a volcano were disposed of by pouring them into the school Dumpster. The Dumpster contained paper, fats, etc. from the school kitchen. A fire was produced. (918)

875. In 1978, New Britain General Hospital, the disposal of acid toxic waste was to pour it on the ground. This was done with approval! (928)

876. A Chemistry I, student was lighting his burner. After it was lit, he proceeded to shake the match and toss the extinguished match into a nearby waste can. The can ignited shooting flames to the ceiling. The flame was quickly extinguished by using a wet towel.

The problem was due to improper cleaning of an alcohol spill by a Chemistry II student. The saturated paper towels had been put into the can from the previous period.

After that incident, I check all waste cans after every lab period. (503)

877. There was a large open area, a one gallon can of duplicator fluid was apparently disposed in a waste basket during an IPS class. There were three IPS classes going on at the same time. Someone used matches and dropped the used match into the basket. The explosion that followed was enormous. It rocketed everything up and did great ceiling damage. (566)

Improper Handling

878. In 1986, St. Joseph College, in a General Chemistry lab, students were doing an experiment on gas chromatography. The students actually were building their own simple GC using Tide detergent as the column packing, methane as the carrier gas and a copper coil/flame detector. Small 1cc syringes were used to inject samples of carbon tetrachloride, chloroform, methylene chloride and various Freon. A student was getting a sample from the hood; another student was standing behind him with an uncapped

syringe in his hand. He was holding it low. As the front student bent over, he backed into the needle. Ouch! (830)

879. I received a request for copper sulfate from a colleague in the elementary school across the street. This substance was for an experiment to be done by a student under his supervision. This is done as a yearly project. A portion of the chemical was sent in an unmarked bottle. The mother of the student was a school board member. The mother decided to send the chemical excess back to me by means of her older daughter. The daughter, not wanting to detour from her schedule, gave the chemical to a student who had me for class later that day. The student, now in possession of the copper sulfate, was associated with the local drug culture. She passed out the copper sulfate in English class claiming that it was "blue rock candy." Three or four students ingested varying amounts of the chemical. One was sent to the hospital to have his stomach pumped. (863)

880. An organic chemistry student at a college in Pennsylvania spilled a chemical on herself. The chemical quickly dissolved her skirt and burned her skin. (892)

881. A student washing a test tube in the lab sink. He flicked it to shake excess water from it. The tube had a previously unnoticed chip on the upper edge. While flicking it, the student lost control. The tube hit the top of the teacher's hand and sliced it.

The results of not disposing of chipped tubes and having too many hands in a sink was six stitches for the teacher and a very shaken student. (659)

Improper Instruction

882. In a Junior College, a second year chemistry student was in an organic lab. I don't remember the particulars of the lab. The lab instructions said to slowly add one chemical to another. One student in the class did not read the lab before entering the room and added the chemical all at once. Needless to say, he and several other students wore the results of his action. No one was hurt and a lesson was well learned.

In a lab situation, students must read the whole procedure before beginning. (610)

883. In my first year of teaching, I followed a lab procedure using Drano to show an exothermic reaction to my junior high students. The test became so hot it spilled over. Luckily, no one was hurt. (684)

884. Watch out for seemingly safe equipment and chemicals. In a chemistry book I am currently using, the students are told to heat an empty glass flask to show how air expands when heated.

Through a one holed stopper and tubing the expanded air was lead over to a test tube under water. You are also supposed to let it cool to show how air contracts. However, there is a good chance that some water will go back into the empty hot flask along with the air.

If the water goes into a sill very hot flask, it could be instantly boiled and the steam pressure can blow up the flask too easily. (707)

885. A laboratory assistant in a large university was cleaning storage bottles with diluted acid solution. Proper techniques had been emphasized except for one minor detail. No one told the student not to place a cap on the container being cleaned. After 25 or 30 bottles were cleaned, the assistant placed a cap temporarily on one of the bottles. The bottle exploded. Fortunately, we had baking soda and emergency showers available. The top one third of the broken bottle is now secured above our sink in our prep room as a reminder. (762)

886. On another occasion, the same student did not properly connect water hoses. The lab and students were sprayed. (962)

Improper lab safety

887. In the hood at a company, a small oven spontaneously caught fire behind the control panel. Burning chemicals ran out through the vents, burning the area around the oven.

Spill residues had been allowed to collect for years without being cleaned out. It is believed that a chemical reaction of the residue finally occurred, resulting in spontaneous combustion. (509)

888. Most teachers at my middle school are elementary certified with little or no science background. We have a relatively large number of hazardous chemicals in stock. My concern is that these teachers are not aware of the potential for problems that exist in their labs. (524)

889. A sixth grader was assigned a science project to do at home. He decided to build a volcano. His father, a music teacher at another school, brought home an explosive combination of chemicals for him to use to simulate an eruption. The mixture exploded and the student lost some fingers. The father sued the school district his son attended. (571)

890. Two students had large splinters enter their thighs by brushing against unprotected wooden lab table edges. (589)

891. We moved to a new school where a stone slab had been placed behind each sink to place glassware to dry. The slab was never attached to the wall. One day after I had finished washing some glassware, the entire slab slipped and crashed to the floor. The slab ripped the faucet off the sink. There wasn't anyone near by or else there could have been some serious injuries. (669)

892. Do not store chemicals alphabetically. All labs should have forty-five square feet per student. (738)

893. With the help of two-graduate student, I was teaching a lab class with 90 students while remodeling was taking place. During class time, an electrician insisted on working on the ceiling. I refused to allow this. He went to the Dean of the College who ordered that he be allowed to proceed. The Dean assumed all responsibility. I felt it unsafe. I moved the students from the area. The electrician slipped off his aluminum ladder, hit his head on the lab top and was unconscious. His ladder flew twenty feet down the aisle and could have seriously injured students. (739)

894. In 1970, a college organic lab student was in the back of the lab when her beaker containing flammable liquids caught on fire. She lost control of her senses, started yelling and waving her hands wildly. The instructor simply walked back and covered the beaker with a watch glass and the fire was out. This taught me to always remain calm and to talk my students through possible accident problems. Basically, the important thing to remember is to keep a cool head during an accident situation. (799)

895. Sometimes people are too used to smelling odors from a chemistry lab. A few years ago, an explosion knocked out a teacher working alone. By the time people paid attention to smoke from the lab, the fire was quite advanced. Worse yet, people were very slow responding to the fire alarm thinking it was another routine drill. (852)

896. In 1986, Durham High School, our school nurse states that the athletic program is the primary source of accidents, the play ground injuries being second, the chemistry lab third and the shop program last. She blames students are horsing around without thinking or knowledge of the consequences. (920)

897. In an elementary lab, a girl bent down by the lab table. Students in the group were doing an activity with pulleys pulled over a ring stand. She claimed she was hit in the head. It was later claimed that the accident had caused severe damage to the nervous system. The insurance company settled out of court. (960)

898. A safety inspector wearing steel toe shoes was pulled across the concrete floor when the electromagnets for a particle accelerator were activated. He strained his leg muscles trying to resist the forces. (998)

899. In my room, I have a movable demonstration table. I was demonstrating the use of a laser that had a very short electrical cord. I had to move one corner of the table closer to my only electrical outlet. I taught the lesson and everything went well. The next period involved the same lesson. As I was explaining aspects of laser use, I walked over and straightened out the table just to make room. After I finished my remarks, I announced to the class that I would now turn the laser on. As I pulled the cord to plug the laser in, it was yanked off the table and crashed to the floor. The damage was $500. (669)

Improper storage

900. A stock boy left an empty wagon parked across the end of an aisle. The wagon was only visible one foot above floor level. A salesperson walked into the wagon and suffered a leg injury. (615)

901. Biochemistry, post-doctoral student stored endocrine extracts in organic solvents in open 50-milliliter glass tubes in the freezer section of a laboratory refrigerator. It was an ordinary household type.

One morning, about 15 minutes before the rest of the lab staff arrived, one technician about to enter the lab was confronted with an explosion. The door was down off the refrigerator; all the contents blew out and sprayed all over the room. The technician became an emotional wreck. Fortunately, the rest of us had not yet arrived. We spent the day cleaning up. (647)

902. When I graduated from college and went out to interview for a job, one of the interviews took me to a large high school on the coast of Connecticut. When I arrived, I was sent to the science department office. The department chairman and school principal were surveying the damage of a fire that had happened in the lab a few days earlier. As I passed through the lab, I noticed what looked like the molten mess of a telephone. The heat had been so intense that the phone had melted and touched the floor. It had been located about four feet up the wall.

When I asked what had happened, I was told that gallon bottles of concentrated sulfuric acid and ammonium hydroxide were on the floor in the stockroom. When a janitor swept the floor, he knocked a bottle of each together and the ensuring reaction caused the fire. (681)

903. When I was a student teaching, my critic teacher was asked to present a display of his many biological specimens in the school's display case. Because of poor judgment the specimen jars were too heavy for the glass shelves that were holding them. The shelves and display case collapsed spilling formaldehyde all over the school’s lobby. The school had to be evacuated during the clean up. Nobody was severely hurt but many of us had upset stomachs because of the fumes. (700)

904. Our custodian stores ditto machine fluid in an outdoor shed. He sometimes filled the empty fluid cans of methanol with gasoline and used it to fill lawn mowers, snow blowers, etc. Somehow when a box of fluid was brought into the school, a refilled can of gasoline was also brought in. Before school, a teacher filled the ditto machine and proceeded to run off a ditto with little luck. As teachers came into the teachers’ room, several were smoking. The room started to fill with the very distinct odor of gasoline. Luckily someone yelled out "Don't smoke" and cigarettes were quickly put out. Although I felt that school should have been dismissed, it was not. Many teachers and student got headaches and were nauseated. (706)

905. In 1988 at Middle School, a wooden cabinet with glass front doors was being used to store chemicals. From an unknown cause, the cabinet tipped and the chemicals fell

out, mixed and a noxious vapor was formed. There was difficulty in trying to clean the spill and part of the school was closed for more than a day. (825)

906. In 1960 at the Plax Corporation in Connecticut, a custodian was freeing a clogged trap in a drainpipe in a cabinet containing bottles of organic chemicals and inorganic acids. He broke a bottle and many bottles flew out of the cabinet onto the lab floor in a horrible mixture. Fumes, smoke, heat, etc. were instantly generated. (870)

907. While working at Pratt and Whitney in East Hartford in the heat treatment department, we often had to degrease various machined parts. The acid basin was below floor level, guarded by a waist high solid railing. Supposedly, a worker fell over the railing in one of these degreasing stations. His bones were all that was seen of him when fellow workers came to assist. (876)

908. A ninth grade student dared another student to eat lead nitrate for a dollar. He ate several spoonfuls without the teacher noticing. The Lead nitrate had been placed on the counter in a labeled container for lab use that period. The student spent two days in the hospital. (891)

909. In a chemistry lab at college, a light fixture fell on the acid and base bottles during lab class. It happened right at a place where a student was standing. (929)

910. In 1987 at a New Hampshire, Sears Roebuck, a worker was obtaining a case of paint from the storage area, he turned to walk and fell on both knees. He received severe trauma to his right knee. The cause was plastic strapping material on the floor. The accident could have been prevented by proper maintenance of the area. (938)

Improper Supervision

911. In using a circular saw to make boards of cedar from a log, it was discovered that the cedar had a rotten inner core. Pushing on the log forced the cedar to go through quickly severing the person's thumb and damaging two fingers. (592)

912. A high school student was run over by the propeller of a motorboat while water skiing. It left his face with very obvious scars. (600)

913. I was doing a demonstration on how pure elements are mixed to form compounds. I went to turn on the water valve from underneath the lab bench. While I was under the sink, one of my students turned on the water faucet attached to the sink. There was a rubber hose attached to the faucet. When the water came out of the rubber hose, the hose began to twist and spill water all over the place. Since I didn't know the water faucet was on, I was caught by surprise. In any case, I bumped my head and when I got to the faucet I was very fuzzy and knocked down a graduate cylinder. I sustained several small cuts. (609)

914. A somewhat unstable young man was extremely frustrated at not being able to identify the components of his unknown (lead and mercury ions). He drank his unknown. We identified the contents of the unknown and the amounts. He was sent to the hospital emergency room to have his stomach pumped. (620)

915. Two high school students were interested in fireworks. They purchased the necessary chemicals and worked in one of the student's cellar. In trying to make explosives, they ground some of the material together resulting in an explosion. Fortunately, they were only burned slightly. The parents had to replace a cracked cellar wall. (635)

916. In 1982, during a high school biology lab, we were conducting experiments to identify biochemicals. A student, contrary to directions, decided to mix all the reagents. Toxic fumes were released. Student experienced eye irritation. (790)

917. One Friday morning in 1974, I signed in at 7:18 A.M. and proceeded to the third floor in the old building where I taught General Science. After filling the boards with material the students were suppose to study and copy, in preparation for a quiz to be given on Monday. I set up my demonstrations at the lab table and my work at my desk. The students came trickling in as I went over the materials on the board. I made two demonstrations, one of which involved an Erlenmeyer flask, a balloon and some water. The water was heated causing the balloon to expand and later contract on cooling. In order to heat the system, I used a small tomato paste can with holes punched near the bottom and a small amount of 70% isopropyl alcohol which came out of a yellow one gallon can. I had intended to add some sand in the bottom to stabilize it but never got around to it. I had knocked the can over on previous occasions but nothing had ever come of it.

The burner provided a nice blue authentic hot flame for the experiment with metallic ions. This experiment I was doing at my desk with individual students when a student approached me and asked to do the experiment. I handed him the matches. The student was egged on to put alcohol in the flask as well as in the burner. Suddenly, I heard a sharp crack and a whoosh with billowing black and yellow smoke. Student screamed and ran for the exit. I grabbed one girl whose vest was on fire and smothered the flames. I reached for the fire extinguisher just as another teacher came in, grabbed my aquarium and doused the remaining flames.

The can was judged to be unsafe. Three students sued the school board for 1.2 million dollars. They collected. (792)

918. In 1985, in honors level, high school Biology class of sophomores, students were evaporating a nontoxic substance from the surface of a microscope slide. The lab manual illustrated the slide being held in the flame of the Bunsen burner. One student did this instead of passing it through the flames. The slide broke apart into small pieces. The same thing happened with a test tube. It too shattered into fragments. Fortunately, the students only received minor cuts on their hands.

Teachers should always clarify correct evaporation techniques and stress the wearing of goggles. (801)

Improper technique

919. A student used a string type dust mop to absorb a quantity (500ml) of an organic solvent. After wiping up the spill, he leaned the mop handle against the wall and walked away without reporting the incident.

The next morning, the mop handle was found resting on top of a pile of ashes. During the night, the solvent had apparently oxidized rapidly enough to ignite and smolder. Fortunately several cartons of paper in the same room were far enough away not to be ignited. (501)

920. An angular momentum conservation experiment was being performed using a rotating seat on a permanent base. The student had a two-kilogram weight in each of his extended hands. The student was asked to keep his hands high and bring the weights in and out slowly to illustrate conservation of angular momentum as he was made to rotate. Student dropped his hands, in the extended position, and whacked the back of his hand against a nearby bench. (530)

921. In industry, I have witnessed a chemist leave a large reservoir of water under heat and superheat it. The water blew out and hit the overhead florescent lighting and showered me on the other bench with glass and debris. (531)

922. A student in a sewing class put the needle through her finger. The needle broke. None of the needle was protruding from the finger. The student admitted that she looked away while she was sewing. (595)

923. In a junior high class, a student was heating a closed system. The test tube exploded firing the stopper like a missile at the ceiling. (605)

924. In a middle school a student failed to lubricate the tubing. The tube shattered and passed through the palm of the student. (672)

925. Each year, I was in the habit of doing a demonstration involving the depression of the boiling point of water by reducing pressure. About 75 milliliters of water was boiled in an open round bottom flask (250ml). When the water reached boiling, the flask was stoppered and then run under cold water. By decreasing the pressure, the water keeps boiling. But, by decreasing the pressure, the stopper was sucked into the flask. I had always removed the stopper by heating the flask back up and popping it out. I had also always put the apparatus behind safety glass, just in case.

Last year it paid off. When the apparatus was being heated something gave away and the entire apparatus and safety glass shattered. No one was injured. I don't do the demonstration any more.

This demonstration was suggested in a teacher resource book, but did not suggest how to remove the stopper. (664)

926. In a college lab, a girl was wearing glasses. She splashed a few drops of solution on her cheek. She removed her glasses and wiped her cheek with her hand towards

the center of her face. She therefore, got some of the chemical in her eye. No permanent damage occurred. But, a trip to the doctor was needed. (611)

927. A student singed off his eyebrows and part of his eye lashes when leaning over to write in his lab book. (637)

928. A janitor wanted to warm a can of beans for lunch. He placed the closed can in an old furnace. Fortunately, he then left the lab. All the students and staff were at lunch when the ensuing explosion occurred. The furnace was embedded in the brick door in the opposite wall. (644)

929. I had a student rub her eye with a chemical. It caused eye irritation. You must constantly watch and remind students not to put their hands near their eyes or mouth. (683)

930. The class was instructed to take bacterial samples from around the classroom. Cultures were incubated and grown. As the teacher made observations of the open plates, she inhaled the spores of fungi resulting in a severe lung infection. (694)

931. I was using a torque wrench to demonstrate how it measurers torque. I did not have an object with a boost to apply torque to. I therefore used a second wrench on the first wrench. This slipped and the large torque wrench flipped up and hit me in the head causing a cut and some dizziness. (695)

932. When demonstrating how to make an acid solution with a particular molarity, a teacher was pouring acid into a glass container partially filled with water. The heat produced cracked the glass in a ring at the bottom. When she picked up the bottle the bottom fell out and acid splattered. (719)

933. Two years ago we were conducting an experiment on the solubility of salts. One student placed a thermometer that was in a beaker of potassium chloride and water, in her mouth not knowing what was in the beaker. (768)

934. In 1970, Connecticut, a high school physics teacher was demonstrating the deformation of material with a hydraulic press as compared to cast iron pieces which can fracture. The piece slipped loose and was hurled the length of the classroom and embedded a piece in the rear wall. It was his first time using the hydraulic press. (907)

935. This is a personal accident that happened when I was growing up. My mom was frying chicken. The fat caught on fire. She screamed and my dad ran in and poured water on the fire. The fire went "swoosh" causing the curtain above the stove to catch on fire. My dad ripped them down and stamped the fire out. My dad had been a volunteer fireman for 19 years when that happened. He forgot what to do in a crisis at home. (968)

936. In January 1985 during a wood working class, one of my students had an accident. He was the only one I ever had in sixteen years. He was cutting a piece of wood on the table saw. He pushed his good piece through, and then he went to push away the waste piece. It kicked back and pulled his fingernail off. (978)

Labeling

937. I found a bottle of acid with the original label gone and a rubber stopper in it. The liquid was brown. I thought it might have been sulfuric acid and the brown color was due to a reaction with the stopper. I moved the bottle to a sink and the stopper blew out with small droplets spraying all over me. The bottle turned out to be decomposed nitric acid under extreme pressure. By sticking my head under the faucet I was able to avoid injury. Over sized glasses prevented eye damage although it took a long time to get all of the soft rubber from the stopper off them. (520)

938. In 1986, Connecticut, during my senior year at Western Connecticut College my partner and I were involved in a protein synthesis lab. We divided our work. I needed some distilled water. My partner got some in a beaker and kept it at our station. She had two beakers, neither had labels. She handed me one and as was my habit I checked to make sure. It was concentrated sulfuric acid that I nearly poured on my hands. Needless to say, my partner wasn't my partner for long. (803)

939. In a chemistry lab in college my lab partner picked up an unmarked beaker. He smelled it to see what the contents were. He took a deep breath and past out. It was ammonia. (831)

940. In 1996, Connecticut, students were testing metal oxides (manganese dioxide, ferric oxide, and zinc oxide) catalysts for decomposition of potassium chlorate. A student couldn't find iron oxide and asked where he could find it. Another student across the room said, "It looks like this" and held up his bottle. The first student then mixed his potassium chlorate with red Phosphorus, which looked like the iron oxide. Upon heating, the test tube it exploded. The student suffered a few facial cuts and fainted, the result of shock. (900)

941. In 1975, a student used the wrong acid (nitric acid) by misreading label or lab manual. An orange gas was inhaled and the student collapsed. (927)

942. In 19611963, at the University of Texas, Austin, when I was a graduate student, my laboratory bench partner made only infrequent visits to our lab. Unwashed, unlabeled glassware tended to accumulate on her side of the bench. One day she appeared, intent upon cleaning her area.

The 500-milliliter round bottom flask contained a reasonable amount of white solid. We later found that the solid had been formed by mixing solutions of one of the borazines and silver perchlorate, and allowing the solvent to evaporate.

My partner was not wearing eye protection when she performed the following experiment. A small amount of the white material on a metal spatula was immersed in a stream of tap water at the sink. The white material exploded violently.

Next, my partner directed a fast flowing stream of tap water into the flask itself. An immediate detonation followed. I was standing, back turned, about six feet away, and was deafened for several minutes. Flying glass shards penetrated all the fluorescent light tubes within a twenty-foot radius darkening the room. The force of the explosion blew the tops off three nearby gallon bottles of organic solvent the liquid line, setting the benzene, acetone and isopropanol on fire.

The ambulance arrived within ten minutes. My partner suffered severe lacerations, particularly in the arm and hand that had held the flask. She also received a number of glass shards, too small to be removed, into one eye. (955)

943. While I was student teaching, we were using microscopes. When one of the students plugged in the microscope, it blew and started a fire in the outlet. Students had destroyed the outlets in the lab tables by putting their pens and pencils in them. No one was injured. (797)

Negligence

944. I was working for a chemical company one summer. I was told that an individual had slashed his hand with a broken beaker. The individual had handled the equipment carelessly. (543)

945. Heating test tubes from base was specifically demonstrated. The instruction was given to check all equipment before starting. Students were given permission to start with one student to watch for problems. One group proceeded to talk while doing lab and forgot to watch how they were heating the tube. The liquid shot out of the tube and splattered on one student. Luckily it never touched the skin and no one was burned and no clothing damage was reported due to safety equipment. It could have been serious due to the close quarters of crowded lab desks. (649)

946. My mother was melting lard in a frying pan to put into a container to store. She left it on and went out of the room. A while later, she returned to find smoke and flames. She put it in the sink and turned on the faucet. Instead of putting out the flames they shot up, within inches of the kitchen curtains. Luckily, the oil burned out and the flame died before setting the curtains on fire. (704)

947. In 1976, Buffalo Airport in Buffalo, New York, November 16, the general foreman’s hardhat was blown off and consequently sucked up by a jet. He thought he could just pick up another hat the next day. Tomorrow came and went and he still did not get a new hat. His job was to join the portable walkway to the terminal. He did not listen to instructions. Instead of waiting for the workmen to follow correct instruction, the foreman climbed to the porthole. Connections had not been done and the holding cable was cut. The foreman was pulled out of the porthole to the concrete and iron

piling 12 feet below. He was admitted to the hospital with a double fracture of the skull and had broken the entire left side of his body. (841)

948. The accident that has made a lasting impression on me was when I severed the tendon in my left thumb. I was fourteen years old. I knew the rules of handling a knife but I had an attitude problem. I thought accidents only happened to others. It could not happen to me. The result was the loss of the flexion of my left thumb. (864)

949. In the spring of 1987, a mother brought her nine-month-old son to a Bridgeport, Connecticut PTA meeting in a walker. She walked near the coffee pot. The walker caught the electric cord and spilled a large pot of coffee on the child. He had burns over 90% of his body. (914)

950. In 1977, a man was burning brush. As the brush piles burned down the coals were raked into the center until the fire burned out. He didn't put the fire out with water. It jumped the burn area and started a forest fire that burned two acres. (859)

Other cases include: 928

Oil bath

951. While making nitrobenzene, the apparatus was overheated. It was in an oil bath and when the distillation apparatus exploded the oil was spilled onto the student causing severe burns. (764)

Paraffin

952. In 1978, Connecticut, a woman was heating paraffin in a pan on the stove and it ignited. She attempted to pick up the pan and place it in a sink. Hot wax splashed over her hands. She dropped the pan and ignited a small rug. She suffered extensive burns over her hands and arms. Minimal damage to the kitchen resulted from fire and smoke. (874)

953. In January 1976 while preparing dissecting trays I was splashed with liquefied paraffin wax. I was wearing eye protection and a lab coat. Even with the protection, I received second and third degree burns on my right forearm. (967)

Pipet

954. Mouth pipetting of reagent in a university research lab caused no immediate adverse impact and was not reported. As a result the person involved experienced a great deal of anxiety over potential health impacts until it was finally discussed with a faculty member. As it turned out, the reagent involved was non-hazardous but the lack

of knowledge of chemical hazards, poor laboratory procedures and lack of communication certainly scared the student involved. (670)

955. In 1982, during an introductory college biochemistry lab, a student mouth pipetted a solution despite a prohibition against such a practice. She sucked some of the solution into her mouth. The seriousness of the situation was compounded by the fact that she did not know which solution she had ingested or whether she had managed to spit it out before swallowing any. Luckily, there was only one potentially toxic solution (diphenylamine) in use at that time and it was assumed that she had been pipetting that solution.

A poison control center was contacted; the maximum dose that the student might have been exposed to was calculated and compared against LD50 data for mice. That was the only available toxicity data. The campus clinic was contacted and the student sent there with a letter explaining the circumstances and relating the information provided by the poison control center. The student was informed of symptoms to look out for and I monitored her for several days.

As a result of this incident, mouth pipetting was even more strongly warned against. The poison control center number was posted in the teaching assistants' notebook. Students were more strenuously required to label chemicals containers and know the nature of materials with which they are working. (850)

Other cases include: 567, 648, 747, 780

Protein

956. In 1982, spring semester, University of New Hampshire, a biochemistry lab was being done on amino acid sequencing of a protein. Students were warned that they were working with toxic reagents and to use care. One of the compounds in use had been measured by the lab assistant and placed in small containers. (It may have been ninhydrin). A student was joking and intended to pretend to drink the reagent. Unfortunately, he really drank the reagent. The student was sent to the infirmary. The incident apparently did no immediate harm to the student. (956)

Other cases include: 938, 859

Radioactivity

957. My first experience with lab accidents occurred during my senior year at the University of Massachusetts. I was in an immunology lab doing an immunoreactive assay. It involves using tetanus toxoid bound to a radioactive material. A classmate was supposed to use a micro pipet to measure the radioactive material. Instead the student used a one-milliliter pipet and tried to mouth pipet. Well, it happened that the student swallowed the tetanus toxoid. (608)

958. In 1961, I was working in a hospital lab on a research grant. The research investigated whether or not brain tumor tissue absorbed more radioactivity than normal tissue. The contaminated glassware used daily was cleaned by soaking in a large ceramic bean pot that was about 3/4 full of concentrated acid. We were given test tube holders to place the glassware into the open pot. One day, as I was placing some contaminated glassware in the pot, the tongs broke. The glassware fell into the pot and the acid splashed back into my right eye. I immediately flooded my eye with water and went to the emergency room for treatment. There was no permanent damage. But, I had a slightly burned cornea. (702)

Refractometer

959. I was a graduate student in chemistry and was working with a refractometer in a physical chemistry lab. The card to the refractometer had a switch on it. When I attempted to flip the switch to use the instrument it literally exploded in my hands and threw me across the aisle to the next lab table. Both of my hands were severely burned. I attributed the accident to defective equipment. I feel that I was in no way responsible for the occurrence. (853)

Rubber stopper

960. An accident occurred to a student who tried to work a piece of glass tubing through a rubber stopper during a lab. The girl held one hand firmly and flatly against the opposite side of the stopper while twisting and pushing with the other hand. The tubing ended up going through her hand. (528)

961. Glass tubing was being inserted into a rubber stopper without using glycerin. The glass went through the flesh. No damage was done to the muscle fibers. (556)

962. Junior High students were doing an experiment where they were required to stopper a test tube to mix a solution and then heat the test tube. A student did not remove the stopper and the test tube exploded. Luckily, no one was injured. (585)

963. A student's hand was cut from broken tubing when trying to push the glass through a rubber stopper. (602)

964. After instructing students on how to insert glass tubing into a rubber stopper a student held a piece of 12 inch glass tubing at the long end and pushed the glass. He applied too much pressure. The glass broke and the momentum carried the jagged glass right up the length of his index finger. He received a cut about two inches long. (624)

965. A student was doing an experiment on solubility. One part involved shaking a stoppered test tube so the chemical didn't touch his fingers.

A later part involved heating the test tube to dissolve more at a higher temperature. This student didn't follow directions and combined the two steps. His test tube exploded showering small bits of glass all over the room. Luckily, no one was injured.

Now, I make a point of telling students to remove the stopper before heating. (651)

966. While making respirators in biology, I had students handle long pieces of glass tubing and subsequently insert the tubing in rubber stoppers. The students were not accustomed to putting such long pieces of glass tubing into stoppers. They were so frustrated with the adjustments that were needed they used excessive force. We sent two to the doctor's office in one day. (765)

967. In a high school chemistry lab, the teacher was doing a demonstration for the class and realized that she needed a one-hole stopper with glass bend for the demonstration. Without thinking, she asked one of the students to prepare the stopper. He inserted the glass bend into the stopper. Needless to say, the glass bend broke and the student got his pinky severely cut. He needed medical attention and was out of activities for several weeks. (823)

968. The most common accident occurs when students try to force a glass tube through a rubber stopper. On several occasions students have badly cut a palm or finger. On one occasion, the student put the broken glass through his hand. (865)

969. While putting glass tubing into the hole of a stopper, the teacher failed to use Vaseline. The result was that the tube broke and the teacher received a severe cut. (932)

970. About 20 years ago at Mount Carmel Academy in New Orleans Louisiana, in a senior high chemistry class while inserting glass tubing into a rubber stopper, the student did not follow directions and she was in too much of a hurry. She needed medical help but was lucky not to have lost the use of one or more of her fingers. (946)

971. Juniors in a Louisiana chemistry class were inserting glass tubing into a rubber stopper. Although they were told to lubricate the tubing and not to push with their palm, one boy did exert enough force to break the glass. It went into the palm of his hand causing a deep enough laceration to require several stitches. (954)

972. Inserting glass tubing into rubber stopper, the glass broke and went through the web of skin between thumb and index finger. Formed a perfect circle, not a drop of blood came out. (983)

973. I was a new teacher teaching students how to put glass tubing through a one-hole rubber stopper. A student tried to do it with out lubrication or hand protection. The tubing broke and went into his hand and the blood came out in spurts. I called for the nurse and put pressure on his hand until she arrived. (988)

Other cases include: 597, 668, 684, 704, 802, 821, 937, 993

Safety glasses

974. A welder had a welder's hood (faceshield) on but did not have his safety glasses on under it. He was welding a stainless steel test rig under a pressure of 24 psi. But, it should have been no greater than a 2 psi., inert gas blanket. The 21-year old welder lifted his shield facemask to inspect the weld he was doing. Instantly, the rig contents of sodium potassium liquid metal shot into his eye. We washed his eye with mineral oil and brushed his hair free of the reacting chemical. His eye burst at the hospital the next day. (529)

975. In an industrial lab, a chemist was preparing a polyester in a four liter glass reaction vessel. The apparatus consisted of an electrical stirrer, thermometer, and a connection to a vacuum pump to remove the water of condensation. The temperature of the reaction mixture was 240 degrees Celsius. During the process, the stirrer became entangled with the thermometer. When the chemist manually tried to free the thermometer and stirrer, the reaction mixture blew out of the vessel and covered his face and hands. His eyes were protected by safety glasses but the rest of his face had serious second-degree burns. (569)

976. A student was distilling a qualitative analysis. organic unknown. It exploded. Fortunately, he was wearing glasses. He was knocked unconscious. His face was covered with small cuts from the glass. The unknown was diisopropyl ether. (630)

977. I use this example each year to show why you keep your safety glasses on even though you are through.

In a college Intro Chemistry lab, a student was just heating a small quantity of liquid in a small tube. The tube shattered and a shard of glass flew about 25 feet across the lab to land in my outstretched palm. The students standing with me discussing a calculation observed the incident. It hit home to them what it could have done to anyone's eyes. (677)

978. A student completed a lab assignment and cleaned up his area. He removed his apron and his glasses, picked up the ring stand to return it to storage. As he removed it from the desktop, he jerked it off the desktop and the tip of the stand hit him in the eye. He lost two days of school.

Future instructions: the last thing to do in the lab is remove your glasses. (656)

979. A student was heating sugar and three-molar solution of hydrochloric acid and sodium hydroxide in a flask. Somehow, some of the materials splashed up into her eyes. She could not open them for two days. The other students reported she was not wearing safety glasses. (726)

980. In 1987, four students were heating a solution and boiling it. They were going to remove the beaker from the wire mesh using tongs after the boiling was completed. As one girl approached the beaker with the tongs, the beaker seemed to leap off the stand onto the floor. I was close by and none of us remember the tongs touching the beaker. The solution stained one girl's shirt. She changed into another. Fortunately, the beaker broke on the floor away from people so no one was cut. All had on safety glasses. (821)

981. A visitor from the Ferrite Core Manufacturing Operation sustained an eye injury when one of the ferrite cones popped out of the oven door that had been opened to show the process to the visitor. (997)

Other cases include: 549, 608, 669, 675, 739

Scalpel

982. During a frog dissection, a student cut his hand with the scalpel. I washed it out and put a Band-Aid on it. I then sent him to the nurse for antiseptic lotion. (593)

983. In a Middle School Life Science Laboratory, we were doing frog dissection. Because of a deficit of laboratory equipment, I asked the students to bring in manicure scissors or any other instruments available at home that could be substituted for dissection instruments.

One student, whose mother is a nurse, brought in disposable scalpels, one for each lab group. On the second day of dissection, I allowed him to gather the scalpels and distribute them to the group. Instead of handing them out democratically he began to pick and choose who in the group would receive a scalpel. I watched as one student became impatient and yanked a scalpel out of his hand, causing a rather severe injury to one of his fingers. (780)

984. A college biology student was doing a dissection and sliced his finger with a scalpel. The teacher had the student wash the cut off immediately and called for the school nurse who was not in the building at the time. The teacher applied pressure to the finger to try to stop the bleeding and had the student sit down for several minutes. The teacher then sent the student to the office with a fellow classmate. The injured student passed out in the hallway and now in addition to his cut, has a bump on his head. The teacher had the student sit in a chair to wait for the arrival of the nurse. (839)

Shield

985. In an undergraduate organic chemistry lab, a student was nitrating an aromatic molecule. He was working under the hood, but the sash was not pulled down. He was

heating the reaction mixture when it ignited. A lab instructor reacted very quickly and put out the fire. (856)

986. Two students were making soap. While heating sodium hydroxide, it splashed on the scalps of three students twelve to fifteen feet away. No shields were being used. (871)

987. During the 1980 Spring semester at the University of New Hampshire, in an undergraduate organic chemistry lab, a student was nitrating an aromatic molecule (toluene?). He was working under the hood, but the sash was not pulled down. He was heating the reaction mixture when it ignited. (I'm not sure what started the fire). A lab instructor reacted very quickly and put out the fire. No one was injured. (934)

Other cases include: 733, 734, 974

Syringe

988. We were doing a GC experiment in general chemistry. Students made a simple GC out of glass tubing and Tide detergent using methane as the carrier gas. The syringes we were using were initially sterile.

After injecting a sample, a student withdrew her syringe and somehow managed to stick herself in the finger.

Another student was waiting behind a student drawing a sample from a bottle in the hood. The student who was waiting did not have the cap on her syringe and was holding it about belt level. The student at the hood backed up and was "stabbed" by the syringe. (574)

Other cases include: 662, 878

Thermometer

989. I repeatedly have had trouble with students trying to insert thermometers into a stopper. Even with lubrication, I would end up with someone jamming it to the point of breakage, cuts, spills and stitches. One remedy was to prepare them ahead of time myself. (505)

990. A student failed to use glycerin on her thermometer while attempting to insert it into a one-hole stopper. The thermometer broke. The jagged end gashed her hand. (598)

991. As a teaching assistant in graduate school, I had a student who was attempting to put a mercury thermometer through a rubber stopper. The student had trouble inserting it and tried adding more glycerin. He then tried pushing with greater force. He not only pushed it through the rubber stopper but into the palm of his hand. He not only had a

bad cut but also was sent to the hospital for treatment of possible mercury poisoning. (727)

992. In 1982, during a physics lab, a student was attempting to insert a mercury thermometer into a rubber stopper. He had not been instructed to remove the thermometer in the first place. He did so on his own. He had not been given instruction on how to properly insert the oversized object into the normal sized stopper hole. The thermometer bulb broke off in the stopper causing the jagged end to slip off and penetrate the palm of his hand,. A local hospital treated the wound and an accident report was filed. (778)

993. While trying to push a thermometer through a two-hole rubber stopper, a student pushed too hard. He broke the thermometer and suffered a serious cut on his hand. The situation was further complicated by the fact that mercury was involved and the wound was a puncture that did not bleed very much. (758)

994. In 1980, During an IPS class, a student was inserting a lab thermometer into a two hole stopper. He did not use glycerin although was instructed to do so. When he forced the thermometer it broke and he cut through the end of his middle finger. He had stitches. Seven years later he still has no feeling in the end of this finger. (877)

Other cases include: 657, 658, 835, 842, 943, 855, 933, 975

Thistle tube

995. In the mid-80's, in a high school chemistry lab, students were generating hydrogen with hydrochloric acid and zinc. The student improperly positioned the delivery tube and thistle tube funnel. He left the delivery tube down in the liquid. The released Hydrogen backed up through the thistle tube and splattered the student. (791)

Ventilation

996. A very good friend of mine is a mechanic and while I was getting my car repaired at his place of business, a fire started in the storage room. The storage room contained cases of oil, carburetor cleaners, dry gas, etc. Thank goodness the fire department was just across the street or else the whole station would have been blown up.

Investigations done by the Fire Marshall showed the store room did not have proper ventilation. (563)

997. During a lab, methyl mercaptan was not used under the hood and the room began to fill with the vapor. An advisor came in and put the bottle under the hood but the vapors didn't seem to clear even after the windows were open. It was soon found that the ventilation in the hood wasn't working correctly. (679)

998. In my school, the ventilation is poor at best. Apparently 75% of the air is recycled. I guess this is to save on heating cost. Teachers are always complaining about headaches any time any hazardous chemicals are used in the labs. Some day, we may live to regret this ventilation system. (685)

Wax

999. In 1987, New Hampshire, one of my coworkers was melting wax for dissection pans. He placed the pan across two ring stands with a Bunsen burner underneath. When the wax was melted he tried to remove the pan using two sets of crucible tongs. The pan tipped over spilling the hot wax all over the lab table and the floor. Fortunately, the man received only a few small splatters on his clothing. He had no protective clothing on at the time. (854)

H

I

APPENDIX I. About the Laboratory Safety Institute

The Laboratory Safety Institute is a non-profit organization whose mission is to make health and safety an integral and important part of science education, work, and life. LSI provides training, consultations, publications, audio-visual materials, and responds to requests for information.

LSI was founded in 1978 as The Laboratory Safety Workshop by James A. Kaufman, Ph.D.. His experience working for the Dow Chemical Company convinced him that schools and colleges were not doing enough to encourage health and safety. Studies by LSI and others have shown the accident rate at schools and colleges to be 100 to 1000 times that of Dow and DuPont.

Since 1978, Dr. Kaufman has trained over 35,000 science educators and scientists. His brand of safety training is a unique blend of technical information, practical and inexpensive solutions, humor, and accounts of accidents drawn from a collection of over 3,000 examples.

LSI has produced two lab safety, training audio-visuals: The One-Day Lab Safety Audio Course (5.5 hours) and The Two-Day Lab Safety Video Short Course (eight, 90-minute VHS Cassettes)

LSI publishes a newsletter: "Speaking of Safety".

LSI offers lectures, seminars, short courses, audit and inspections, and regulatory compliance and safety program development consultations throughout the world for academic, industrial, medical, and government laboratories.

LSI operates an Internet discussion list, LABSAFETY-L, and maintains an informative website (http://www.labsafety.org)

LSI is supported by corporate sponsors, agencies, associations, generous individuals, its members. Members receive a newsletter subscription, use of the audio-visual lending library without rental fee, a 10% discount on most LSI publications, a 5% discount on training and consultation services, and use of the Toll Free, 24-hour Lab Safety Information Hotline.

The Journal of Chemical Education called The Laboratory Safety Institute "A national resource for safety conscious science teachers". If you would like to help support the efforts of The Laboratory Safety Institute: (1) Subscribe to "Speaking of Safety", (2) Become a member of LSI (partially tax deductible), and (3) Make a contribution (tax deductible).

Free copies of our “Laboratory Safety Guidelines”, Publications List, Audio-Visual Lending Library List, and Introduction to The Laboratory Safety Institute (containing seminar schedule and membership Information) are available on request. For more information about LSI, contact: The Laboratory Safety Institute, 192 Worcester Road, Natick, MA 01760 508-647-1900; Fax: 508-647-0062, Email: info@labsafety.org

APPENDIX II. About the Editors

Dr. Fariba Mojtabai is a former Research Associate at both the Laboratory Safety Institute and the Brigham and Women's Hospital. She is employed by CVS Pharmacy as a Pharmacy Manager. She received her bachelors degree in Pharmacy & Chemistry from Massachusetts College of Pharmacy and her Ph.D. in Pharmacy from the Massachusetts College of Pharmacy.

Dr. James Kaufman is President of The Laboratory Safety Institute, President of Kaufman & Associates and former Professor of Chemistry at Curry College. He received his bachelors degree in chemistry from Tufts University and his doctorate in organic chemistry from WPI.

After two years as a post-doctoral fellow in the WPI Chemical Engineering Department converting garbage into fuel oil, Dr. Kaufman joined the Dow Chemical Company's New England Research Laboratory as a Process Research Chemist. During his four years with Dow, he became increasingly involved in laboratory safety related activities. He authored "Laboratory Safety Guidelines". Originally distributed by Dow, now over two million copies of the widely requested and reprinted brochure are in circulation.

Dr. Kaufman is the founder and president of The Laboratory Safety Institute - a national, non-profit center for safety in science and science education. LSI's lectures and training programs, AV-lending library, Mini-Grants, Internet discussion list, and publications help academic institutions throughout the world. LSI is supported by grants from individuals, foundations, companies and professional societies.

The Laboratory Safety Institute conducts seminars, short courses, audits and inspections for schools, colleges, and companies. They also provide advice on regulatory compliance, safety program development, facilities design and editorial commentary on laboratory texts.

Dr. Kaufman is a former, ten-year member of the American Chemical Society's (ACS) Council Committee on Chemical Safety and is past-chairman of the 2,500-member ACS Division of Chemical Health and Safety. He is the author-narrator of the ACS Audio Course on Laboratory Safety and editor of "Waste Disposal at Academic Institutions" from Lewis Publishers. He recorded and edited the "One-Day Laboratory Safety Audio Seminar" and "Two-Day Lab Safety Video Course." Most recently, he co-authored "Safety Is Elementary: the new standard for safety in the elementary science classroom"

APPENDIX III. How You Can Help

The Laboratory Safety Institute gratefully acknowledges the generous support of our sponsors. Since 1980, our major benefactors have been:

ACS Council Committee on Chemical Safety, ACS Division of Chemical Health and Safety, Cabot Corporation Foundation, Carolina Biological Supply Company, Fisher Scientific-EMD, Flinn Scientific, HoneywellBull, Lab Safety Supply, National Safety Council Foundation for Safety and Health, Northeastern Section of ACS, Polaroid Foundation, and Union Carbide.

As we expand both the number and scope of our services, we need the voluntary support of those who enjoy and appreciate our efforts. Furthermore, it is vital that our professional and corporate supporters see their commitments to the Laboratory Safety Institute matched by the enthusiastic financial support of individuals. May we invite you to help by becoming a "Friend of the Laboratory Safety Institute"

Please be generous. It is a worthy cause.

* * * * * * * * * * * * *

Yes, I would like to make a donation as a "Friend of the Laboratory Safety Institute" in one of the following categories:

( ) BENEFACTOR [$1,000 or more]

( ) SPONSOR [$100 to $499]

( ) PATRON [$500 to $999]

( ) COLLEAGUE [$30 to $99]

( ) FRIEND [UP to $30]

___ Enclosed is my check for $ _____.

___ A matching gift is available from my employer.

Name and Title _____

Address _____

_____

City _____ State _____ Zip _____

Please return to: Laboratory Safety Institute
192 Worcester Road
Natick, MA, 01760

Checks should be made payable to the LABORATORY SAFETY INSTITUTE. The Laboratory Safety Institute is a tax-exempt organization under Section 501 (c)(3) of the IRS Code.

PC:7\lsidata\Accidents\LBAV2.doc