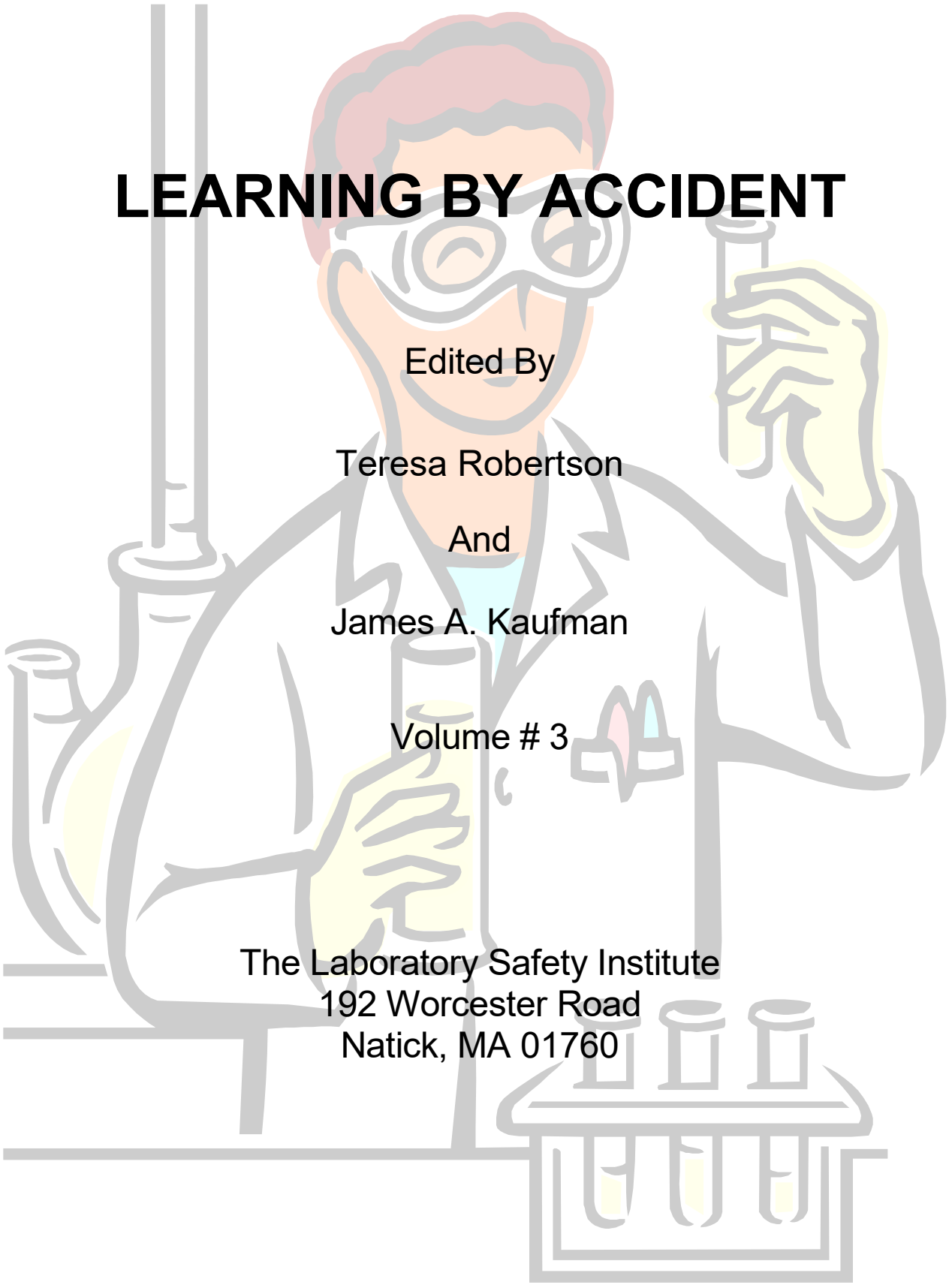

LEARNING BY ACCIDENT

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Volume # 3

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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 folk lore, folk lore 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.

Acetic Acid

1001. During a high school biology class a student teacher spilled glacial acetic acid on the floor. He attempted to wipe it up with some paper towels. He severely burned his lungs and ended up in the hospital. He should have neutralized the acid with base then mopped up the residue. (1341)

Other cases include: 1012

Acetone

1002. A serious accident I witnessed took place in a university organic chemistry lab when a lab demonstrator lit a burner down the desk from a student drying glassware with acetone. A very interesting river of flame formed flowing back to the surprised student holding the acetone bottle. He dropped it and it remained burning until someone had the presence of mind to throw a fire blanket on it. The student was burned quite badly and cut on broken glassware in the process of jumping away from the flame. (1240)

Other cases include: 1031, 1095, 1450

Alcohol Burners

1003. A science teacher in a middle school was using alcohol burners in a non-science room. An explosion occurred when the open burner dropped. Four students were burned. A law suit is still in litigation. The teacher quit because of questioning during investigation. She had complained in writing about safety concern but the department chair said it was part of the state curriculum that that experiment should be done. (1023)

1004. In the early days of IPS when one school was in the midst of a population explosion the program was selected because of adaptability of non-laboratory rooms for a lab centered course. Alcohol lamps, for example, replaced the need for gas service.

A former social studies teacher was "pushed" into teaching the course, which he hated, in an ordinary jr. high class room.

Near the end of a period when students were replacing their hot alcohol lamps on the supply table, one of the students upset an open alcohol supply beaker. The spilled alcohol ignited and cascaded to the floor at the feet of several students who were gathered around the table. They panicked and began to run. Although there was a fire extinguisher in the room, the teacher did not know how to operate it. Finally one of the students figured it out and extinguished the flames. (1045)

1005. In 1982 in an eighth grade IPS class students were using alcohol burners with a rusty top, spilled alcohol on the lab table by turning the burner over. The entire table

flamed up. I moved everyone back and let it burn out since the table was flame proof. (1103)

1006. After explaining the proper use of alcohol burner one team of two junior high students decided to relight their burner. While one student was lighting the burner the other was pulling on the wick with a tweezers. In doing this he also pulled up the cork a bit. The fumes ignited and blew the cork off the burner splattering fluid on one of the students shirt. I happened to be standing with my back to them but when I turned around I was able to put out the flames with my hands. (1268)

1007. The students were sitting four to a table while doing a lab experiment. The alcohol lamp was used to heat up some water. At one table one lamp fell over and dropped to the floor. The alcohol spilled out and caught fire spreading along the floor.

The students knew were the bucket of baking soda was and how to use it. The fire was put out quickly with no injury.

I always start the term with the alcohol lamp lit and then take some alcohol and spread it on a table top. I then light a match and set it on fire. It is quite dramatic. I then take a handful of baking soda from the red bucket and throw it on the fire. The fire is out. I have one student do it again. The point is then remembered. (1317)

1008. While working with alcohol burners a student poured some on a wooden table that was the lab area. It caused the student next to him to get his fingers burned. The table was old and probably had many different substances on it. The flame did not go out easily. (1395)

1009. A team of seventh graders was using an alcohol burner in an experiment. When one student attempted to burn the burner off by the knob the lamp was over turned. There were flames all over the table. This happened about fifteen years ago. (1416)

1010. This occurred many years ago in our junior high. A teacher asked a student to move an alcohol burner during a lab. The alcohol somehow got spilled and caught fire. The student was seriously burned. (1484)

Other cases include: 1065

Allergic Reaction

1011. My next-door neighbors were in the process of adding a second floor to their home. One Saturday the father was taking care of the children. During the day the father brought up rolls of insulation to the new addition. The children were in the room as the father worked.

That evening the youngest child, aged three, woke from a sound sleep crying and screaming with pain. The baby sitter was alerted and watched the child for several hours trying to soothe him back to sleep. After the parents finally came home they took him to the hospital when they noticed he was having difficulty breathing.

It was determined the child experienced an allergic reaction to the insulation which the baby sitter never would have anticipated. (1234)

1012. One student was washing a beaker over a sink. Another student emptied some acetic acid from another beaker into the same sink. Some drops from the acetic acid spilled on the first student's hand. The second student immediately informed the teacher who put the student's hand under the tap water and washed the hand thoroughly.

That night the girls father phoned and blasted the teacher. His daughters hand had swollen. She was allergic to acetic acid (vinegar). (1499)

Other cases include: 1145

Ammonia / Ammonium Hydroxide

1013. During the summer we did a program with kids developing blue prints by taking Diazo paper with designs shadowing areas of the paper. When exposed to light the yellow paper turned white, then by exposing the paper to Ammonium Hydroxide it turned blue and the kids could see the designs left by the shadowing. The kids loved it, our staff did not. When traveling with the container of ammonia in a hot car, the fumes often became too much to bear. Our solution was to carry the ammonia in an iced down cooler. (1133)

1014. When I was in high school our chemistry teacher opened a bottle of ammonia and asked a student to put his nose over the bottle and inhale. The student passed out. (1143)

1015. I became ill while making ammonia gas due to a lack of ventilation. This occurred in a chemistry class in 1966. (1384)

Other cases include: 1272, 1336, 1494

Ammonium Dichromate Volcano

1016. This happened at a college during a chemistry department open house in the early 1970's.

A showy, pyrotechnics display of an ammonium dichromate volcano was set up on a bench top with no access barriers to visitors who were circulating freely among several "live" chemistry displays. Without warning the four-inch diameter, two-and-one-half inch high volcano exploded well into the normally smooth pyrotechnic phase of the display. Burning embers struck a woman on the arm causing a second degree burn. The lady was very agreeable, graciously accepting first aid and apologies. She did not charge the college.

The college's authorities were notified and were predictably nervous. No similar experiments were performed as a result. The explanation of the explosion was never satisfactorily reached. I have since run the same demonstration behind proper shields. (1152)

1017. The teacher was demonstrating a volcano eruption using ammonium dichromate. The teacher thought the chemical would not ignite so he poured alcohol on the ammonia dichromate. He relit the chemicals. The volcano exploded with the burning alcohol splattering the students standing around the demonstration table. A number of the students were rather seriously burned. The teacher and the school were sued. The case was settled out of court. (1356)

1018. In an elementary class a teacher was demonstrating how volcanoes explode using ammonium dichromate. Sparks flew up and landed on the dress of a girl sitting in the front row catching the dress on fire. The girl was seriously burned. (1374)

Animals

1019. A child brought a pet squirrel to class. Someone opened the cage, and the squirrel bit a student. Very fortunately no infection. Classes should have no live animals in cages that students have access to. (1127)

1020. In 1954 a college junior was doing research on the life cycle of rattlesnakes. He had a mother and some young snakes in the locked area in the laboratory. One Saturday he wanted to show his girlfriend how the mother snake reacted to movement. He put his hand into the cage toward the mother but a safe distance. He did not notice one of the very young snakes was close to the back of his hand. The young snake bit him.

At the time I was the only student lab assistant in the building. I place a tourniquet on the arm and got him to the hospital. He was there for a week. (1148)

1021. We had a nice piece of undisturbed woods behind the high school on school property. It was ideal for ecological studies. We could take a class out for one or two periods of field work without the hassle of trip permits and buses. One time we were conducting plot assays - counting every plant and its size within a measured area. Suddenly we found ourselves being attacked by yellow jackets who had a ground hive right within one plot. Everyone was stung, one girl had to receive medical attention.
Moral: Carefully check the ground before taking a class out for field study. (1156)

1022. In a rural school in Montana a twelfth grade student brought a live rattlesnake to school for biology class. Rattlesnakes are very common in that area. The teacher put the snake into an empty aquarium, put a lid on the tank and a rock on the lid. After telling all the students to look but not to touch he went to the back of the room to work with a student needing help. A student in the front of the room opened the case, grabbed the snake and was using it to scare some girls.

The snake, which was being held just in back of the head, wiggled free far enough to reach around and strike the thumb of the student holding him. The boy was hospitalized in critical condition for several days. Anti-venom was administered several times. The boy was able to return to school several weeks later.

This was settled out of court with the teacher paying all medical bills. (1159)

1023. During the 1987-88 school year I had a student bitten by gerbils kept in the room. The parent wanted me to pay for the tetanus shot. I had instructed the class as a whole not to touch the gerbils. I have good control of my class all year. Four months after being instructed not to touch the gerbils during the five minutes of switching class the student asked if she could pet the gerbil. I was busy half listening and said yes. She was bitten. I sent her straight to the nurse. No shots were given, not problem from the bite. (1325)

Benzene

1024. In 1983 in West High School, Manchester, NH a chemistry teacher was working in the stock room standing on a stool. Apparently someone had left a container of benzene open. Water leaked through the ceiling from the roof, contacted a light socket producing a spark. The benzene vapor ignited. The teacher was knocked off the stool and rendered unconscious. He came to, crawled out of the room and was found by two other teachers. The fire destroyed the stock room. (1063)

1025. In our college organic lab, a student caused a benzene flash (with a Bunsen burner), leaving blackened strings of organic material floating around the classroom. Personally, I left the room. (1088)

1026. A student heated benzene and hit the flash point. A ball of flame shot up to the ceiling. No injury. (1145)

1027. During my undergraduate days I recall an accident that happened in an organic chemistry laboratory. A female student was cleaning a reaction vessel with benzene. The round bottom flask had a small opening. She was in a hurry to dry the flask in order to go on with the next step of the lab. She inverted the flask over a lit Bunsen burner. The benzene vapor ignited and the flask had the appearance of a rocket engine with flames shooting out. Fortunately the amount of benzene was very small; the fire burned it self out and no one was hurt. (1211)

1028. A college student was carrying a pan of benzene. A burner several feet away set the vapor on fire. His hands were seriously burned. (1445)

Bicycle

1029. A number of years ago the Canadian Youth Hostels Association had an accident occur on one of their cycling trips. Apparently the brakes on a young girls' bicycle had failed. She ran into a tree while negotiating a curve in a road.

She was paralyzed and in the ensuing law suit the Association was found guilty on the grounds that they were negligent in checking her bicycle for mechanical conditions. They did not check that she was fully informed on how to ride a bicycle. (1492)

Blender

1030. A twelfth grade male student in an Advanced Placement Biology lab was preparing a chlorophyll extract using spinach and a Waring Blender. The blender had clogged. The student removed the top of the container, reached in with his hand to stir the contents without turning off the blender. In so doing, the student freed the blades and lost a chunk of his index finger. His lab partners had tried to stop him but he had moved too quickly for them to physically prevent him from putting his hand into the container. (1302)

1031. The instructor was beginning to prepare a spinach extract for a student paper chromatography experiment. This is accomplished by grinding spinach in a blender using acetone to suspend the chloroplasts, then vacuum filtered to obtain the extract.

There were three factors contributing to this accident:

One, the blender in use was the common household "Waring" type with a glass container and a loose fitting, hard plastic lid.

Two, an excessive amount of acetone was added to the blender container at the start of the process.

Three, the high speed switch was pressed. The acetone surged up the inside of the container, splashed out the lid and ran down the outside of the container to the table top.

The acetone vapor traveled under the blender motor base where it was ignited by sparks produced by the rotating electric motor. The flash ignited the liquid on the outside of the container which ignited the acetone inside the container which in turn propelled the lid into the air.

A fire extinguisher was close at hand and the fire was put out quickly, the equipment cleaned up and the experiment was continued without further incident. Needless to say a stainless steel container with a screw top was put on order the next day. (1454)

Bromine

1032. One of my eleventh grade chemistry students wanted to see the vapors from bromine. I told him to take the bottle to the hood and open it. He did, wasn't impressed and put the ground glass stopper back in the bottle. Then he decided to look at the liquid so he rolled the bottle on its side. The stopper came out of the bottle, bromine

splashed on his hand and he dropped the bottle in front of the hood. He got scared and someone yelled for me. I told him to wash it off and then I realized I didn't know what else to do so I had to get the poison control number and call them and the fire department.

The bromine caused burns on his hand that left a scar. I am now overly sensitive to students handling any chemical out of curiosity. (1104)

1033. In my college organic lab, bromine was being added to a flask on a hot plate. The bromine was being added from a one-pint bottle which slipped out of the students hand and fell on the hot plate. The room turned orange but luckily all the students escaped safely. When an instructor went to open the windows, I noticed he was quite seriously burned. (1200)

1034. Samples of chemicals were set up in a display in my sophomore high school class. The students were directed to examine the materials but not to open the containers. I specifically indicated that the bromine sample was not to be opened, particularly due to its high vapor pressure. Of course one student opened the container and got some bromine on his leg.

God was on our side because just prior to that week I had read about how quickly bromine can be absorbed from skin by glycerin. The student was directed to rub glycerin into the spot, following it with water. No burns resulted!

I have since removed bromine from my element demonstration. The thought of bromine in a student's eyes was too frightening.

I have also learned that a solution of sodium thiosulfate would also have absorbed the bromine. (1219)

1035. I was a college junior taking Organic Chemistry and the lab for the day was the bromination of an alkaline. Liquid bromine was being added using a dropping funnel to a flask containing cyclohexene. The student working just to my left had failed to grease the stopcock on his dropping funnel before adding the 25 ml of liquid bromine to it.

The experiment was well in progress when this student noticed that liquid bromine was dripping outside the stem of the dropping funnel. He reached up to tighten or adjust the stop cock and the whole glass piece came out in his hand. Apparently the guard was either missing (if metal) or dissolved (if tubing) by the Bromine.

Bromine vapors quickly filled the air as liquid bromine spilled along the bench top and down onto the floor. Realizing the severity of the accident both lab instructors immediately evacuated the lab of all the students, opened all windows and sponged the liquid bromine into the nearby sink.

Both professors were out of work for the next two weeks with severe burns to their hands and nasal passages. None of the students were hurt. (1229)

1036. In a college organic chemistry lab in Hillsdale college I was working on a bromine lab. I was using standard organic chemistry glassware. Red bromine gas escaped from the glassware and burned several of us. (1321)

Other cases include: 1477

Bunsen Burner

1037. In a high school lab a student was "drying" his beaker with gas from the gas jet. He had observed the advanced chemistry students drying glassware with an air jet and gas and air were all the same to him. The gas build up was ignited by a flame from another burner in the room. (1089)

1038. A student was going about lighting a Bunsen burner. Her partner turned on the gas after the match was lit. As she lit the burner flames occurred at the bottom of the burner. (Tubing at the bottom of the burner had been loosened.) She immediately turned off the gas.

Our class motto: "When in doubt, turn off the gas!" This could have been very dangerous. The students should have only lab materials at the lab stations; no pocketbooks, lunches, unnecessary papers. (1117)

1039. In 1980 I was a first year graduate student employed as a teaching assistant, instructing a freshman biology lab. The very first class required the students to use a Bunsen burner in practicing aseptic techniques (sterilizing needles/loops, etc.) and making various slides of micro organisms.

I asked the students to light their Bunsen burners. I had previously placed one burner at each station. I was suddenly made aware of a roaring sound and a stream of fire. One student had ignited the gas outlet valve. He did not know what a burner was. This taught me not to take anything for granted when explaining to students. I now try to be very specific and explain the steps in great detail. (1216)

1040. In a high school chemistry I class around 1980 an experiment of chromatography of chlorophyll pigments was being conducted. One pair of students were working on the chromatography lab and were heating a solution of methanol in which leaf material is placed. They were working near a slightly opened window using a Bunsen burner, ring stand and ring support and water bath set up. Both were wearing goggles and aprons.

About six feet away another pair of students, not wearing goggles, were working on the same lab but were further along in the experiment. Their procedure required the use of several solvents including petroleum ether. They were preparing the solvent chamber and the TLC plate. Apparently the ether was left open. Suddenly a fireball erupted severely burning the students. The ether container and the solvent chamber both burned.

Since this accident Bunsen burners are no longer used to heat alcohol and ether is not used. (1226)

1041. Students were heating a chemical when the gas tube to the Bunsen burner came off. The flame transferred to the gas supply. It happened during a practical exam so everyone was in silence. From the stir this caused the girl in the front row turned, saw what was happening and turned off the gas at the source. (1313)

1042. A student in a chemistry lab was entering data in a lab book. A Bunsen burner was on the lab table burning. The student reached across the table to pick up a piece of equipment and burned his arm in the flame from the burner. (1381)

1043. A student was attempting to light a Bunsen burner in a high school chemistry class. As the gas ignited the flame shot higher than he thought it would and burned his eyebrows and the front of his hair. The student had neglected to regulate the gas flow at the Bunsen burner prior to lightening it. Since the gas flow was at a maximum the resulting flame was dangerously high.

Students should be taught proper lab techniques. (1420)

1044. A Bunsen burner was left on all night. The next day a person turned on the light switch. From it a tiny spark ignited the gas which has built up in the room. (1451)

1045. A student turned on the gas jet and properly lit a Bunsen burner. The gas jet fell off the wall connection (loosened by another student the previous period) and a flame shot out of the wall. The gas shut-off valve was located behind a panel under a desk. A Phillips screwdriver was needed to open the panel. (1455)

1046. While demonstrating a lab that required lighting a Bunsen burner. I adjusted the burner as per safety instructions. I continued to talk to the class as I opened the gas tap and held the lit match to the burner. However, I had opened the wrong tap. Eventually the gas lit and the ball of fire singed my hair. They called me "flash" for the rest of that year. (1491)

Other cases include: 1076, 1102, 1121, 1164, 1169, 1170, 1171, 1211, 1219, 1228, 1233, 1234, 1261, 1264, 1339, 1340, 1395, 1412, 1490

Burns

1047. The problem I have had most often is having students in a microbiology class touch a hot ring stand, test tube or inoculating loop. The students have been warned to avoid touching these things but while doing the experiment sometimes forget. (1307)

1048. In a high school chemistry lab in 1978 while working to turn crystals into liquid I was told to deposit the liquid we made, after heating the crystal, down the sink. Left over water in the sink came in contact with the warm liquid and it flew out on to my arm. It gave me a second degree burn after it burned through my shirt. (1382)

1049. Pouring "ditto fluid" from a one gallon can to a small plastic bottle a fellow teacher had the fumes ignite from a pilot light close by. He was hospitalized for four months with burns over 40% of his body. (1471)

Other cases include: 1001, 1002, 1003, 1010, 1016, 1017, 1018, 1028, 1032, 1035, 1036, 1040, 1042, 1043, 1046, 1055, 1077, 1082, 1097, 1102, 1103, 1106, 1115, 1123,

1127, 1146, 1153, 1154, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1175, 1176, 1184, 1189, 1192, 1195, 1196, 1197, 1202, 1208, 1216, 1228, 1230, 1233, 1251, 1255, 1256, 1260, 1265, 1074, 1281, 1304, 1305, 1306, 1307, 1308, 1309, 1313, 1314, 1315, 1316, 1327, 1328, 1329, 1330, 1335, 1360, 1366, 1408, 1409, 1412, 1413, 1420, 1421, 1430, 1433, 1455, 1456, 1458, 1460, 1461, 1462, 1463, 1465, 1466, 1472, 1476

Centrifuge

1050. A centrifuge was being used, which I was operating. I was wearing safety glasses. The students were instructed to stand back after placing tubes in the equipment. When the machine was turned on glass shattered and flew over the room. No injuries.(1285)

Chlorine

1051. In a senior level science class the teacher was preparing chlorine gas and bubbling it through a succession of water filled flasks to dissolve the chlorine. A mistake was made in setting up the delivery tubes in reverse order. As a result pressure built up in the first collection bottle. The stopper lifted and chlorine gas spewed out into the classroom. The situation was quickly corrected by adjusting the glass tubing arrangements.

The teacher should have taken the time to double check the set up before starting the experiment. (1244)

1052. An eleventh grade girl inhaled chlorine gas during a chemistry lab when she leaned over the collecting bottle. She had to be taken to the hospital for some respiration therapy. (1282)

1053. In 1965 during a high school chemistry class a student placed chlorine gas in the sunlight and the glass bottle exploded. There were cuts, and a minor scare to the class. The teacher was out of the room. (1327)

1054. About twenty five years ago students were making chlorine gas. One student pushed his gas bottle under the nose of another and said take a whiff. The student did and immediately passed out. (1333)

1055. I prepared several bottles of chlorine gas for a chemistry class. The bottles were on the front table. A freshman physical science class followed the chemistry class. A freshman student took the stopper out of the bottle and took a good sniff of the curious green gas. He was taken to the hospital with mucous membrane burns to the nose and throat.

This happened between classes when teachers were to be in the halls to monitor. Students in all classes were constantly told not to disturb any materials at the front table or any where else. (1337)

1056. Two students were working on a project and produced chlorine gas. They were not under the hood. (1422)

1057. In the old days when "let's try it" was the way of life and safety was a pair of safety glasses, we convinced a chemistry teacher we should produce chlorine gas and collect it by the downward displacement of water. Twelve or so lab groups produced more than enough gas to fill the collector bottle. Two or so student ended up in the hospital. (1498)

Other cases include: 1223, 1477, 1499

Chlorosulfonic Acid

1058. In a college organic chemistry class in preparation of an antibiotic, chlorosulfonic acid was added to other reagents in a Florence flask. The other reagents had to be dry and were not. As a result the flask burst and sprayed acid on the student. The student was wearing goggles and quickly went to the sink to wash off the acid. No lasting damage. (1350)

Chromatography

1059. In 1982 in a senior chemistry class a student was affixing his paper chromatography strips on a clothesline suspended within the fume hood. He had calculated the Rf values of all the +/- twenty essential acids. The ninhydrin spray solution had been prepared. Prior to spraying the strips he did not notice, nor did I, another student doing work close to him for which a heat source was needed. Upon freely spraying the strips, the aerosol caused the strips to combust within the hood. No injuries. All was contained within the hood. (1094)

Other cases include: 1031, 1040, 1173

Copper Sulfate

1060. A student was weighing 250g of $CuSO_4$ powder on triple beam balance. The powder overflowed and sent into his face. He was using a spoon from the five pound jar.

I should not have had such a short student help me or I should have used a shorter table. The student knew the hazard of swallowing because he got some in his

mouth. He was told ahead of time. Thank God he told me immediately what happened. (1385)

Other cases include: 1118

Cuts

1061. In a biology lab the most serious accident was injury done by a scalpel or sharp blade or broken glass. (1362)

Other cases include: 1002, 1053, 1067, 1068, 1069, 1070, 1109, 1129, 1130, 1136, 1138, 1139, 1141, 1142, 1148, 1193, 1194, 1209, 1217, 1244, 1255, 1269, 1324, 1364, 1369, 1372, 1375, 1377, 1378, 1379, 1381, 1384, 1394, 1407, 1436

Discipline Problems

1062. As he was exiting the room in a rage, a discipline problem boy grabbed the fire extinguisher and expelled it into the face of another student, causing eye problems. (1012)

1063. A high school student had taken a chunk of sodium from the laboratory during the lab exercise, wrapped it in a paper towel and put it in her pocket book. I discovered it missing and dealt with it by announcing over the intercom it should be returned to the lab instructor and not further mention would be made of it. (1024)

1064. Student broke a glass tube into his wrist. Student picked up glass off of side counter during laboratory session even though it was not part of experiment. This student had read Safety Rules, First Aid Rules, signed a Safety sheet and taken a quiz. He was, however, frequently absent and disruptive in school and the community. He failed to report it to me immediately and left the room. (1294)

1065. In eighth grade the county superintendent's son threatened to throw a lighted match into an alcohol burner. He was suspended. (1346)

Other cases include: 1400

Dissection

1066. In a ninth grade biology lab, during a dissection, preserving fluid squirted out and hit the student in the eye. The student should have been wearing goggles. (1077)

1067. A student was dissecting a perch in a college biology laboratory. He was using a scalpel to cut into the fish. Another student came by and pulled the scalpel out of his

hand seriously cutting the student. Since they were fooling around, they decided not to tell me. After school, the injured student was taken to the hospital where he received three stitches. (1081)

1068. Around 1985, a tenth grade biology prep student was dissecting a cow heart. She had a dissecting pan, a brand new scalpel blade, and was wearing gloves. She attempted to dissect the heart while holding it in her hand. I'm not sure of the details as to how the scalpel came in contact with her hand but it did. It was quite a deep cut that required stitches. (1084)

1069. As a graduate assistant in a freshman biology in 1981 during a lab I witnessed the following accident. At the end of a rat dissection lab, students were cleaning their instruments: forceps, scalpels, needles, etc. One student after washing her scalpel was drying it with a paper towel. Inadvertently she cut her index finger exposing ligaments and what I thought was the bone. I immediately wrapped the cut in a paper towel and told her to apply pressure. Since there were other graduate students assisting I took the student to the infirmary.

As a result of the experience I now caution all students with the following instruction. Scalpels are dangerous instruments, they show no mercy and take no prisoners. So be very cautious in both cleaning and drying. (1108)

1070. In a tenth grade biology class doing a dissection a blade broke. I showed the student how to replace it. As he turned around holding the blade in front of him another student walked by receiving a cut. It was not severe but could have been. (1134)

1071. In May 1986 in a tenth grade general biology class in a suburban Atlanta High School the students were doing the dissection of a fetal pig. They had been working on the project for four days. The instructor had been moving from group to group to review each one for the lab practical test.

Two students were reaching for a scalpel at the same time from opposite sides of the table. A girl picked up the scalpel and stood with it in her hand as the boy across the table stood up and leaned over the pig to get a better look.

The scalpel penetrated his chest on the left side about five cm below his clavicle to a depth of approximately three cm.

The boy did not report the injury. The teacher noticed the boy's pallor and noted the bloody paper towel he was holding to his shirt. We applied direct pressure, called EMT's and took him to the emergency room for stitches. (1149)

1072. In 1987 in a Connecticut high school a student was dissecting a cat. A piece of preserved tissue went into the student's eye. The student was not wearing goggles. (1161)

1073. A tenth grade biology was dissecting through the skull of a frog to expose the brain. While removing some of the bone and muscle a student chipped off a piece of tissue which arced and landed in another student's open mouth. The startled student made a gulp and swallowed the formaldehyde treated piece of frog bone and muscle.

A call to the poison control center assured us the piece was too small to be too concerned about. The student complained of slight pain when swallowing for several days. (1193)

1074. A tenth grade female student was beginning a dissection in a biology class. The class had been directed to lift the skin with forceps and to make a v-shaped incision. This student disregarded the directions and used a wire probe to jab at the specimen. The action caused the formaldehyde (this happened over twenty years ago) to squirt out into her eye.

Students had been told explicitly to ALWAYS wear safety goggles in the lab, regardless of the type of the lab to be done.
The student in question had her goggles hanging around her neck. (1305)

1075. In a senior high school in 1984 while doing frog dissection a student pulled on the frog intestine with forceps. An unseen small perforation in the intestine squirted formalin about two feet into the student's eyes. Well trained students started to flush his eyes before I could get across the room to start first aid. (1323)

Other cases include: 1116, 1370

Distillation

1076. This occurred in college in 1986. Unknown substances were given in test tubes for students to determine what was present. The mixtures were various alcohols, ketones, etc. for an organic chemistry lab. Part of solving what was in your tube was a distillation process. This tall complex apparatus was used with Bunsen burners.

The highly flammable liquids condensed on the outside of the glassware and without obvious warning, in one sudden poof, a huge ball of flames was apparent. Fortunately the flames did not injure anyone but it was difficult to put out the flames and the whole situation was scary. (1062)

1077. A student suffered third degree burns on the fingers of the right hand. This resulted during a fractional distillation procedure from the IPS program. The student unable to regulate the heat, boiled the liquid too fast and the alcohol vapors caught fire, in turn igniting the rubber delivery tube. The student tried to bring the burning tube to the sink which resulted in the burns due to hot rubber sticking to the skin. (1287)

Other cases include: 1160, 1235, 1414, 1449

Distraction

1078. I was a second year teacher at the time. I was conducting a high school chemistry lab with about 20 students present. I was working at one end of the room at

one work bench in a group of four students. I did not notice a cheerleader enter the room to speak to a student. The student's partner had just gotten a small amount of sulfuric acid from the stock supply bench. When the student who was distracted turned and picked up the small beaker of sulfuric acid it was hot causing her to drop it and the contents splattered over the bench as well as herself. She screamed. I immediately pulled her under the shower removing her outer skirt and sweater. After a bit I took her to the nurse where she received further showering. No scars. (1080)

Ear Injury

1079. This occurred during a ninth grade homeroom. A carnation sale was being held. One boy received two carnations with the stems cut on a diagonal. He stuck the stems of each into each of his ears. Another ninth grader, sitting behind him, slapped each carnation with his hands. The first student had one of his
ear drums punctured. This all occurred during the instant that I turned around to put a short note on the chalkboard. (1488)

Other cases include: 1182, 1225, 1436

Eating in the Lab

1080. While working in a lab I got hungry and made popcorn with beaker, oil, corn seeds but what is popcorn without salt? No problem. Went to the chemical storage area for sodium chloride. I started eating it but it did not taste right. I used sodium perchlorate instead. Never eat in a lab is now my motto. (1015)

Electric Shock

1081. In the fall of 1987 in a senior high school physics class an experiment was being conducted involving a free fall apparatus in order to determine the value of gravity. The apparatus has an electromagnet connected to an AC power supply and a spark timer that imprints a dot on a waxed paper strip. With the circuit closed an object is placed on the electromagnet, the switch is then opened, the object falls, the sparker then produces dots every 1/60 second (later to be measured and calculations made from time and distance.) Simultaneously the switch must be opened and the sparker turned on. A student prematurely hit the switch as the object was being placed on the electromagnet. The instructor became the conducting circuit and received a severe shock. After time and relaxation he was alright. (1191)

Other cases include: 1082, 1084, 1087, 1088, 1089, 1090, 1091, 1092

Electrical Conductivity Apparatus

1082. The worst lab accident of which I have personal knowledge took place in an eighth grade physical science class.

The teacher was demonstrating the electrical conductivity of ionic and non ionic solutions. The teacher apparently grasped across both electrodes when removing the apparatus from the salt solution. Since the apparatus was still plugged in the teacher received sufficient electrical shock to be knocked to the floor. The teacher received burns on the hand and a bump on the head. (1318)

Electrical Outlet

1083. While teaching in Belize, a student in a colleague's class poured a beaker of water into an electrical outlet at his lab table. The electrical outlets were mounted flush on the table tops. Our initial reaction was to turn off all the power in the lab building (instead of seeing which fuse went to the outlets.) (1087)

1084. The ninth grade biology class was performing a lab dealing with solutions, suspensions, and colloids. As a part of the "solutions" portion of the lab students were identifying the properties of electrolytes and non electrolytes. One student had set up his experiment and as he plugged in the electrolyte "light bulb" apparatus sparks flew and he jumped. He received only a mild shock sensation and no burns.

What we discovered was the cover plates on our electrical outlets are metal. As he plugged in the apparatus, he was less than careful. Part of the plug went into the socket, part of the plug made contact with the metal plate.

Since that time, the same situation has occurred about three times. Each time with no serious damage.

I carefully instruct my students in the danger but if students are careless it can occur again. (1093)

1085. A male eighth grade student stuck a plastic barrel ball pen into the electric outlet at his desk. The pen exploded and the ink cartridge extruded to three times its original length. It was shot from the plastic barrel with enough force to penetrate the steel cabinet door behind the students desk. (1304)

1086. While conducting class discussion I noticed one student (a very bright boy and the son of another science teacher) fiddling with his pencil in an electric outlet which was at eye level on the lab bench. I told him that what he was doing was not a good idea and then went on to explain (facetiously I had hoped) that he would more effectively electrocute himself by using a paper clip in the shape of a horseshoe and putting one end in each side of the outlet. This brought a few chuckles and we went on with the class.

Several minutes later from the same area of the room came crackling and popping noises. Soon after, there was the smell of something burning and bright flashes. My young science student was as white as a ghost and luckily unhurt.

He followed my advice but being smarter than most he knew enough to try to insulate himself from the paper clip with a piece of paper folded several thicknesses. Of course the flash was the sparks flying and the paper burning.

The location of the outlet was convenient for labs but not for this. I should not have suggested, even in jest, something which could be dangerous. (1306)

1087. About 1983 a student was using a spring scale and placed the hooked end into an electrical outlet. It caused the circuit to blow. The student received an electrical shock that was only slight. The student was not supposed to be using the electrical outlets. The class had been taught about electrical safety. (1328)

1088. A student put metal forceps into an electrical outlet. He received a shock. It could have been fatal. (1347)

1089. A cover plate from an electric outlet located on the edge of the lab table was missing. A female student with a "chain belt" leaned into the open outlet. Sparks resulted and part of her belt melted. The student claimed heart problems as a result of electric shock. This happened in a biology class about fifteen years ago. (1354)

1090. Outlets were newly placed near the lab sinks. The students were using hot plates. One student incorrectly heated a liquid breaking the beaker. The student received a shock due to the closeness of the sink. (1366)

1091. In the fall of 1986 the two-year-old daughter of a ninth-grade science teacher was playing with car keys in a classroom after school hours. She placed the key into an electrical outlet. Sparks and a "pop" sound scared her and she cried, apparently unhurt. The key was damaged. The socket was blackened.

The child should not be playing with keys. Covers should be on all outlets. Master cut off switch should be in the hall. (1402)

1092. I had a classroom with electric outlets on the floor. One of my students wanted me to look into his microscope which was plugged into the floor socket. I walked over to the table and accidentally kicked his plug out. Without watching what I was doing, I went to plug it back in. I was nearly electrocuted. Our sockets are now in the ceiling on long reel cords. (1479)

Other cases include: 1406

Electricity - Lock Out / Tag Out

1093. In the middle sixties I was working at an E.I. Deposit plant as an electrician. We had a very strict policy on "Locking Out" any circuits that we were working on while

installing 440 V. wiring. I asked if the circuit was locked out and received a positive answer from a co-worker. I disconnected the wiring that was to be patched into and turned to pick up a tool. My leather work pouch hit the disconnected wires grounding them to the box. The line WAS NOT DEAD. Wiring and box were welded instantly. (1256)

Embarrassment of Disrobing

1094. In South Hadley High School around 1970 during an IPS lab a female student wearing a very light material dress spilled acid. It covered the young lady and 90% of her dress. The student had to disrobe. There were two male science teachers involved. It was very embarrassing to all involved. (1005)

1095. Summer 1965. US government rebuild center. Civilian workers involved in the disassembly, cleaning, rebuilding, reassembling, calibration and painting of tank fire control systems. Acetone, commonly used as a solvent cleaner was accidentally spilled on the unoccupied stool of a female employee. The young lady returned and sat on the acetone. She immediately noticed the problem and rushed to the lavatory where she washed affected areas. The acetone destroyed nylon clothing and caused minimal dermal irritation and much embarrassment. (1070)

1096. In a college lab a fellow student heated A conc acid solution in the soft glass bottle in which it was stored. The bottle melted, the acid dissolved part of her clothing. She ran back to her dorm without telling anyone of the spill. (1072)

1097. A lab technician, in the lab next to mine, for a private company was filling a column with silica gel when it blew upwards. It flew into her eyes and blinded her. She knocked over the concentrated sulfuric acid in her panic. Her partner stood up and screamed. I rushed over and together we put her under the shower. Because she was a new Chinese immigrant she did not want to take off her clothes which were burning. I just tore them off and to this day she will not speak to me for embarrassing her. (1247)

1098. This accident happened to my daughter sixteen years ago. It occurred during a high school science class in a private girls' school.

My daughter was attempting to put a stopper in a test tube. The stopper would not fit, so she held it next to her side and forced it. The test tube shattered and a piece of glass passed through her clothing and entered her side. She was reluctant to tell the teacher. She was embarrassed and did not want to disrobe. Neither my husband nor I could be reached. The school contacted her doctor and took her to the hospital where she was treated. The glass shard came very close to doing serious damage. (1408)

Emergency Eye Wash

1099. A student testing minerals for carbonate with dilute hydrochloric acid got some in his eye. I had installed an eyewash fixture on one of the prep room faucets which enabled a thorough flushing of the student's eye. This fixture cost $33.00. (1286)

Other cases include: 1075, 1118, 1119, 1120, 1121, 1123, 1124, 1125, 1127, 1128, 1201, 1203, 1218, 1241, 1242, 1257, 1341, 1344, 1346, 1348, 1351, 1356, 1358, 1359, 1360, 1413, 1418, 1419, 1424, 1455, 1460, 1466, 1478

Emergency Room

1100. About 1975 a tenth grade biology student was working at her lab table and absent-mindedly put her finger into the metal receptacle in the table used for placing ring stands. In a short time, her finger became swollen to the point that she could not remove it. Conventional methods proved fruitless so we had to unbolt the ring, take the student to the emergency room where the ring was hack-sawed off. There was concern for three or four days of permanent damage due to the loss of circulation. Luckily no damage. (1095)

1101. Students were making ice cream in regular ice cream freezers. Some were adding cookies and M&M's to the mixture. The ice cream had been eaten before it was noticed there were pieces of pills in it. When it was noticed several students became ill. Paramedics were called. The seven to ten ill students were taken to the local hospital and had a twenty-four hour system cleansing regiment.

Investigation uncovered a student had put Ex-Lax pills into the ice cream. The guilty party had to pay all expenses for the student not covered by their insurance. (1150)

Other cases include: 1011, 1020, 1022, 1049, 1052, 1055, 1057, 1067, 1071, 1098, 1118, 1119, 1120, 1124, 1027, 1039, 1141, 1154, 1176, 1181, 1187, 1198, 1201, 1203, 1207, 1221, 1241, 1262, 1265, 1271, 1291, 1309, 1313, 1324, 1328, 1358, 1390, 1463

Ether

1102. In 1975 in a junior college a chemistry lab student was working with ether. Ether fumes got ignited by the open flame from a Bunsen burner. As the student tried to extinguish the fire both sleeves of his lab coat caught fire. Luckily he was wearing a long sleeved cotton shirt under his lab coat. He was singed on his arms. His partner used his own lab coat to smother the fire. Quick thinking. (1181)

Other cases include: 1108, 1122, 1231, 1276

Explosions

1103. Two science teachers were attempting to assist a drama teacher in providing a "flash" explosion for a play. They were using a commercially patented material for doing this. It did not ignite with an electrical spark. The instructor approached the device closely to examine the electrical connection. It exploded and severely burned the instructor, fortunately only on his hands. (1006)

1104. The heat from the sodium caused hydrogen gas to explode resulting in a large "boom". Glass from the test tube and flask shattering everywhere. One piece of glass pierced a bottle of sulfuric acid which was made of heavy grade glass, gallon size. The sulfuric acid was about three or four feet from the demonstrations area. Luckily no students were reported injured. The teacher was never asked to do another experiment. A letter of reprimand was placed in his file. (1014)

1105. A junior high school student was performing an experiment during a science club meeting. He was attempting to make matches. The ingredients were potassium chlorate, red phosphorus and sulfur. The teacher handed the student a mortar and pestle with the sulfur. Instead of grinding the sulfur only the student mixed the three together and ground them. A tremendous explosion resulted. The teacher found the student on his face behind the lab counter. His thumb was almost blown off, surgery was performed to attach the tendon and nerve. As of a year later the student is playing tennis but complains of stiffness. (1042)

1106. In organic chemistry in college a student was heating an experiment when it exploded. He was wearing goggles but no neck protection. His face and neck and above forehead were badly burned. His screams still echo in my ears. (1047)

1107. In an organic chemistry class, while I was in college in 1982, we were working on the production of trans-stilbene. This was produced as gas and allowed to pass through a glass condensing tube. Steam on the end of the condensing tube covered the fact that the condensed product was clogging the end of the tube. I soon was heating a closed system. An explosion occurred. Forty dollars worth of glassware was broken; the stains ruined my clothes, permanently marked my lab book and left a hole on the ceiling of the University of GA laboratory. No one was injured. (1129)

1108. In a high school in California around 1980 a lab assistant mixed phosphorus and potassium chlorate in a two-ounce gas-collecting bottle with a rubber stopper. He started to shake the bottle. The bottle exploded removing one finger and leaving varying amounts of bone and other tissue of other fingers on the right hand.

Strange bottles and stored glass containers in the storeroom where the accident occurred, were pierced by flying glass. Excelsior was started on fire by flying phosphorus. The excelsior was on the floor under shelving containing organics (ether, gasoline) not in the safety cabinets. A student in the adjoining classroom sprayed the shirt of the assistant with a carbon dioxide fire extinguisher. He was taken to the nurse.

The fire in the storeroom continued to burn for approximately fifteen minutes until the fire department arrived. The building was evacuated.

The victim eventually had all fingers removed on his right hand. The big toe from one foot was grafted onto the thumb position which could press against the pad of the rest of the hand. (1154)

1109. While teaching at a junior high in Utah the head of the department used to do a dehydration demonstration using sugar and sulfuric acid. Since each demonstration practically renders a beaker unusable he decided to use wide mouth baby food jars which are quite disposable and cost free. However, the small construction at the top of the jar created enough pressure to explode the jar sending pieces of glass through out the classroom. The American flag was shredded and one girl received a minor cut.

Since the teacher changed the equipment he should have conducted the demonstration ahead of time with the protection of a Plexiglas shield. The incident was clearly a case of lack of preparation and poor judgment. (1443)

1110. The combining volume of hydrogen and oxygen gas was being demonstrated to a chemistry class. Equal volumes of each gas were mixed in the ignition tube and inverted in a 500-ml graduated cylinder of water. The mixture was sparked. As a result a loud explosion followed by screams and the tinkle of broken glass falling up to twenty feet away. Fortunately everyone escaped the flying fragments. Seeing no one was injured I calmly deposited a handful of glass fragments into the container for broken glass. (1450)

1111. Some years ago at a lab demonstration in a chemistry teachers' club an experiment was in progress. A two-liter round-bottle flask exploded, sending glass shards all over the place. Many teachers were injured. (1474)

1112. About six years ago a colleague was asked to make something that would give a colored smoke effect for the drama club which was putting on a play. Working alone in the chemical supply room he was experimenting with different powders. I can't remember what chemical substance he put into a mortar but it exploded. He was wearing safety equipment. His goggles were deeply pitted. He was rather shaken up. (1485)

1113. Investigation of the effect of a catalyst. No serious accident but the potential was there. Incident occurred during a demonstration. It involved the use of new unopened bottle of potassium chlorate and manganese dioxide. As the reaction got underway there was a sudden acceleration in the reaction rate. The demonstration tube exploded showering glass and hot chemicals around. No cuts or damage to teacher or students. (1493)

1114. Synthesis of water. Eudiometer tube exploded. A student investigation using various mixtures of hydrogen and oxygen gas. No cuts or eye damage. Over the course of three classes two of the eudiometer tubes exploded. (1494)

Other cases include: 1003, 1004, 1016, 1017, 1018, 1053, 1085, 1127, 1179, 1180, 1191, 1199, 1202, 1209, 1210, 1211, 1214, 1223, 1258, 1263, 1267, 1270, 1272, 1273,

1275, 1281, 1282, 1283, 1284, 1287, 1320, 1323, 1324, 1325, 1331, 1333, 1335, 1336, 1337, 1343, 1346, 1348, 1349, 1399, 1413, 1418, 1421, 1424, 1426, 1427, 1429, 1432, 1433, 1436, 1448, 1471, 1473, 1481, 1482, 1484, 1485, 1487, 1494

Extraction of Chlorophyll

1115. At a nearby high school in Connecticut, a science teacher was demonstrating to his students the extraction of chlorophyll from plants using heated methanol. He inadvertently poured methanol into a hot beaker which was still sitting on a hot plate. The methanol ignited and splattered burning the teacher and seven of his students. (1059)

1116. In an advanced biology class in the '70's heated alcohol; was used to extract leaf pigments. Students were instructed to cover flare up with upside down dissection tray. This happened - student calmly reached for the tray but it contained old paraffin. Fire extinguisher and wet cloths put it out. (1258)

Other cases include: 1030, 1040, 1185, 1186

Eye Injuries

1117. A junior girl with a rubber "policeman" on the end of a glass rod, absent mindedly holding the policeman, oscillated the glass rod onto the desk. She got a glass sliver in the eye. (1052)

1118. A high school junior girl who was very concerned with her looks had a difficult time keeping her goggles on. During the "Percent of Water in a Hydrate" lab, she removed her goggles several times only putting them back on when reminded to do so. The "popping" of the copper (II) sulfate crystals was told to the students but apparently this student had the "It can't happen to me" attitude. It did. A crystal got in her eye and generated a significant amount of heat when dissolving in her eye. The teacher got her to the eyewash station, contacted the nurse, the local hospital and the girl's parents. Fortunately her eye was not permanently injured but she was seriously shaken up. She remembered to always wear her goggles for a whole two weeks! (1057)

1119. An eighth grade student in an ISCS in the mid 70's was involved in an experiment in which dilute hydrochloric acid was being used. He was a student who was always extremely careful about using safety goggles but for some reason whipped them off for a better look and in some way got liquid in his eyes. It was washed out quickly. He was taken to the hospital where he sat for nearly half an hour before treatment! No eye damage. (1083)

1120. In 1980 I had a male ninth grade student bring a sample of a dry powdered chemical to class to show me. It was from his sister's chemistry set. I asked him to

dispose of it. He blew the chemical in his hand away. It blew into the eyes of a student sitting next to him. We flushed for about fifteen minutes and then transported her to the hospital. She had to wear a patch for a few days and was fine after that. (1118)

1121. In 1981 in a Massachusetts high school students entered the laboratory and began putting on aprons and goggles. As one student reached to get goggles for herself and her partner the partner casually swung the rubber tubing used with Bunsen burners. From a previously run lab by another teacher there was acid in the tubing and it sprayed into the student's eyes. Luckily the teacher responded quickly and the eyes were flushed with water from the eyewash. Sight was impaired for several days but no permanent damage to the eye occurred. (1189)

1122. In a biology lab in 1979 we were doing a fruit fly experiment. The class used test tubes as culture tubes and for etherizing. One student, in trying to free a fly attached to the tube, tapped the tube opening on the table top. The rim of the tube splintered and flew into the students eye. The student was wearing glasses, but not safety glasses.

When the instructor saw what happened he examined the eye and upon observing a piece of glass in the eye, removed it. The eye swelled and the family threatened to begin litigation.

The teacher was saved by the "in loco parentis" statute of Mass. law. Instruction was given to the entire class prior to the lab with specific warnings about fragile glassware. (1208)

1123. Near the end of an eighth grade ISCIS (individualized chemistry class), I noticed a student appeared to be blinking. I asked him if he got something in his eye and he said no. Finally he said his eye was stinging a little. I had him rinse his eye with cold water (this was before the days of eyewash stations, about 1976) and sent him to the nurse. Later I found out he had been treated for a chemical burn.

The student had been working with several salts and wearing glasses. However we figured out that he did not wash his hands and must have put his hands to his eyes. (1220)

1124. I was filling my lawn mower with a gas can that had a flexible rubber spout. When it was nearly filled I was lowering the can to stop the flow. The edge of the spout caught on the lip of the gas tank. The spout was bent and then released from the edge of the gas tank spraying gasoline in both my eyes. While my wife was calling the emergency room I flushed my eyes with the sprayer on the kitchen sink. (1262)

1125. In a laboratory storeroom a technician went to open a five-gallon carboy to get triethylamine. On removing metal cap the ply spout seal needed to be broken. The technician punctured the seal and was squirted in the face with the liquid.

He had failed to pull the spout from the can and gas pressure pushed out the chemical. This can happen with almost any chemical with a low boiling point.

The technician was immediately taken to water and had his eyes flushed. After medical treatment he was required to wear dark glasses for two years. (1269)

1126. A junior girl was mixing or diluting acid and added water to the acid. No eye protection was worn. The young girl lost the sight in her right eye. She did not have on goggles or an apron. This happened in 1963. (1390)

1127. Sometime in 1970, during the early morning in a small graduate student lab at UCI, a third-year organic chemistry graduate student was working. A run involving caustic base in a hood and behind a shield exploded throwing strongly basic solution everywhere.

The graduate student was wearing safety glasses. He was watching the reaction when it exploded. He was alone in the lab. He was knocked to the floor with some of the reaction mixture dripping into his eyes. He was able to get to water right away and irrigate his eyes.

When help arrived he was in extreme pain and his eyes were beet red. He was put in the hospital for two days with his eyes being constantly irrigated. The result: the protective layer over his eyes was completely burned away but he had washed them soon enough to avoid any permanent injury. (1453)

1128. A bright student researched in outside textbooks and found a solvent for her unknown--aqua regia! Praising her for her creativity, the teacher prepared five milliliters of the potent reagent in a test tube in the safety hood. A few grams of unknown were added and it bubbled gently. After a few minutes the student, who had removed her safety goggles while reading, put a stopper in the test tube to carry it across the room to show her lab partner.

The stopper popped off splashing her in the eye. Within two seconds the teacher pulled her a few steps to the eyewash fountain where she flushed her eyes. There were no ill effects except tired eyes the rest of the day. Without the close proximity of the eyewash fountain, and the teachers quick action this could have been a serious permanent injury. (1458)

Other cases include: 1034, 1043, 1062, 1066, 1072, 1074, 1075, 1097, 1099, 1114, 1131, 1156, 1166, 1180, 1194, 1201, 1203, 1209, 1218, 1223, 1226, 1239, 1241, 1242, 1251, 1253, 1257, 1260, 1281, 1325, 1341, 1343, 1344, 1346, 1347, 1348, 1349, 1351, 1356, 1358, 1359, 1360, 1396, 1418, 1419, 1424, 1438, 1455, 1460, 1466, 1473, 1478

Factory Accidents

1129. A worker lost the first section of his index finger on his left hand while working a ninety ton press cutting thirty thicknesses of cloth at a glove factory. His hands were in the machine during the cutting, on the handles of the dye. During the process of moving the dye across the cloth for the next cut, the finger was not on the handle, possibly because of the weight of the dye or in the interest in speed. (1357)

Fainting

1130. Students had been informed that they were about to be involved in performing one of the more hazardous operation required of them in the chemistry lab - inserting glass rods into rubber stoppers.

In spite of pre-lab techniques on safety a student did manage to draw blood. He went to the sink and began cleaning the cut with running water. The sight of his blood led to a faint.

Result - small glass cut on his hand handled with a band aid. A large cut on his head from hitting the corner of the lab bench near the sink - five stitches. (1197)

1131. During the school year 1976-77 on the first day I was doing a lab orientation on safety procedures. A young lady fainted and hit her head a quarter of an inch above her right eye on the corner of the soap stone bench.

Now we sit during lectures. (1214)

1132. A student passed out when taking blood for typing. He hit his head on the side of the lab table as he was falling to the floor. Precaution would be to sit while taking blood and have an ammonia inhalant on hand. (1261)

1133. In biology class a fifteen-year-old girl passed out at the sight of blood. She knocked herself out when she hit the floor. (1322)

1134. A girl passed out at the sight of blood in a blood-typing lab in a sophomore biology class. She fell to the floor hitting her head on a metal stool and the lab table on her way to the floor. (1348)

1135. Blood-typing investigation was being done in a classroom. The teacher was using sterile lancets to puncture the student's fingers to obtain blood samples. This teacher had performed this investigation for several years without incident. All students who were involved were doing it on a voluntary basis with signed permission forms from parents.

A teacher in an adjoining classroom had a student who wanted her blood typed. The teacher doing the investigation volunteered to do the typing of this student. The student came to the front of the room and the teacher pricked her finger. The teacher turned away for a second and the student fainted. She banged her head on the carpeted floor. She sustained a mild concussion. (1380)

1136. A student fainted in class striking her head on the floor. She suffered lacerations to the skull. (1410)

1137. A teacher had students doing blood testing with lancets. He had not instructed the students to sit down. One young man, being sure he would have no problems was standing up. When he saw his blood he passed out. He hit his head on the lab table. (1424)

1138. In a high school biology lab students were taking blood samples for the purpose of making microscope slides. One student, using a lancet, drew a small drop of blood.

Upon observing the blood drop, the student stood up, fainted and fell to the ground. He stuck his head on both the lab table and floor cutting his head.

In prior interviews with the student he informed the instructor that he never demonstrated adverse reaction in previous similar circumstances. Later interview with parents told us that the student had a similar reaction as a child in a hospital. (1482)

Farm Accidents

1139. While working the manure spreader on a farm a fellow worker was trying to force the manure through. It had backed up and he did not turn the spreader off first. His coat got caught and pulled him backwards to the spreader. His back was severely cut. He lost his small finger and he almost bled to death before he reached the hospital. (1393)

Other cases include: 1176

Field Trips

1140. At a geology field camp in Kingfield, ME during the summer of 1968 we were splitting smaller specimens from large rock using a rock hammer. No goggles. The rest of the students were standing around observing. I was hurt by flying chip of metal from the face of the rock hammer. The metal chip penetrated my shirt and undershirt and punctured the skin on my chest. (1075)

1141. During a geology field trip a girl fell and cut her knee. It was not a deep cut and bled little. Being at the knee it did gap open. At the time of the accident we were in a mountainous area and I did not feel that it was serious enough to warrant leaving and returning sixty minutes to school.

The parent became very upset that I did not take her to a hospital and call the parent. She took the student to the doctor who said stitches were not required. The parent was worried about the scar that would be left.

She did not file suit but it was very unpleasant. (1163)

Other cases include: 1021

Fire Polishing

1142. As students were cutting glass and making glass bends one student had a piece of glass that was not yet fire polished on one end. As this glass tubing was being moved another student moved her arm and the two connected. A nasty cut resulted which required stitches. It was especially traumatic for the student because the Junior-Senior dance was that night and she had to wear a bandage. This was in the 60's.

Errors made were glass tubing should have been in shorter sections. At long lab benches students need to be spaced far apart. (1106)

Other cases include: 1371, 1382

First Aid - Choking

1143. During a biology class in a Connecticut school a student of mine in the back of the room began to make choking noises during a lecture. I quickly reached the back of the room and performed the Heimlich maneuver. A small hard candy popped out and the student resumed normal breathing. It happened so fast many students had no idea what was going on. (1186)

Formaldehyde - Formalin

1144. Around 1985 a sixth grade science teacher was in the prep room looking for some equipment. In his haste he dropped a specimen jar that contained formaldehyde. The teacher was alone but managed to escape the room. He notified me and we contained the spill using proper spill pillow technique. The area had to be evacuated because of a common ventilation system in our school. (1230)

Other cases include: 1073, 1074, 1075, 1145, 1344

Fume Hoods

1145. In 1967 as a new teacher teaching chemistry, one of the labs was combining phenol and formaldehyde to produce a new compound. It was in the spring and the windows were open. The students were instructed to use the fume hood while mixing the chemicals. After six periods of this lab, I became very dizzy, nauseous and could hardly walk. I was taken home and for forty-eight hours was extremely ill. To this day I have chronic bronchitis at least six times a year, am allergic to chemical odors and stopped teaching chemistry years ago and will probably contract cancer eventually from this accident.
The errors were several: I should not have been conducting this experiment. If you must do this type of experiment, look for other chemicals. Make sure the hood is working super efficiently. (1022)

Other cases include: 1032, 1056, 1059, 1127, 1128, 1179, 1231, 1232, 1250, 1271, 1282, 1287, 1345, 1353, 1485, 1492, 1497, 1499

Gas Flammable

1146. In a southern high school a cosmetology teacher was working with hair and hair products. The smell of "burning hair" filled the hallways. In the same area, a student was playing with the gas terminals. The student left the gas terminals on when the bell to change classes sounded. Fortunately the teacher was in the habit of checking all the terminals after each class and found the open terminal. (1008)

1147. One day in a basic chemistry lab in 1985 I looked up and saw flames shooting around a student. He had turned on the gas and lit it. His clothing was fire proof. I quickly shut off the gas. Needless to say it made an impression on the class. (1205)

Other cases include: 1004, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1104, 1110, 1166, 1210, 1211, 1212, 1215, 1219, 1264, 1282, 1405, 1428

Glass Breakage

1148. While doing inventory of stockroom material the bottom of a culture dish cracked, fell off and cut open my index finger. (1009)

1149. In a high school chemistry lab students were instructed to use a rubber policeman to clean a precipitate from a beaker. Some of the rubber policemen in the cabinet had not yet been assembled. When a student tried to put the tip on the glass rod it broke. He required stitches. (1183)

1150. A high school senior in 1983 was working on an independent project for advanced chemistry and advanced biology. In the project he was trying to simulate Miller's research on the origin of life. His attempt was to synthesize amino acids.

The apparatus was set up in one section of a chemistry lab that was also used for other classes. A source of electricity was generated after school hours. As the biology and chemistry teachers were showing the setup to the principal one afternoon after the close of school it shattered. (1228)

1151. A student in the general chemistry lab dropped an Erlenmeyer into the sink. He attempted to stop it, and it broke as he was catching it against the side of the sink. A sliver of glass entered his little finger. He was operated on that night for a severed tendon and recovered completely.

This type of accident seems to happen only to careful and conscientious students. (1299)

Other cases include: 1002, 1050, 1053, 1061, 1064, 1098, 1104, 1107, 1108, 1109, 1110, 1111, 1113, 1117, 1122, 1130, 1234, 1240, 1285, 1286, 1287, 1288, 1289, 1290, 1294, 1320, 1321, 1323, 1325, 1332, 1336, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1417, 1426, 1429, 1436, 1449, 1483, 1484, 1485, 1487, 1493, 1498

Glass Failure

1152. Students were collecting an acid in a beaker after which they had to transfer the beaker with the acid to a designated area. The chemistry teacher saw that one beaker seemed exceptionally full so she decided she would transfer it herself. Using tongs she lifted the beaker and as she moved it away from the table the bottom of the beaker give way. She and the group of students at this station were splashed with the acid. The shower in the classroom was used. The students sent to the nurse. All clothes were eaten through. Luckily no serious injuries occurred. (1028)

1153. About ten years ago I had a student using a five pound bottle of nitric acid and the bottom sheared off. Acid went on the student, the floor and me. Having no shower, I had the young man strip down to his shorts and with the help of several students flushed him with water using the largest containers possible. Next I used sodium bicarbonate paste (jak – not recommended) and had a doctor check him out. No burns.

I had burns because I looked after the student first and after he had been taken care of I cared for myself. (1098)

1154. Pace University several years ago. In moving dangerous chemicals from one storeroom to another, one of the custodians was carrying a bottle of nitrous acid. The bottom of the bottle fell out. The custodian was splashed with a body length of acid. He suffered from very serious burns and shock. He was hospitalized. (1487)

Other cases include: 1096, 1217

Gym Class

1155. A student at our school received a detached retina when she was in gym class. Several games of tennis were going on at one time. She was hit by a ball from another court. (1332)

1156. At a recreational facility while liming a field the limer got stuck. In trying to unjam the limer some of the lime got into the worker's eye. He was not wearing eyeglasses or goggles. (1340)

1157. In a private school in 1988. Case is now in litigation. A student was asked to move the faculty volleyball stand. Several students began to move it. In the process the stand fell on a boys foot. The foot was broken and the student was in a cast all summer long. He may have permanent damage to the foot. (1349)

1158. In 1976 a young man acting as football manager was left in the locker room to put out the uniforms. He was not instructed to wash or how to wash the towels and use the towel extractor. He did have access to the laundry area. He decided to wash the

towels. He then used the towel extractor. Once running, he jimmied the lid and reached inside. He lost an arm at the elbow. The coach, school administration and the machine manufacturer were sued. (1391)

1159. A Clay High, Oregon, Ohio student was hitting golf balls. He hit the ball underneath a portable electrical display sign. He went to the sign and probed under the sign with his golf club for the ball. He was electrocuted. (1400)

Hair

1160. During a distillation experiment a fellow student in organic chemistry lab leaned over the apparatus. Her long hair went swinging forward and went up like a torch. She never returned to class and I do not know the outcome. (1026)

1161. In a Kent State University lab in 1971-1972, during a qualitative analysis course, I was involved in the process of purifying my second unknown. Another student was working across from me. I was dissolving my unknown in solution. The unknown was an organic compound so I am sure the solvent was flammable. At the same time I was shaking the funnel, which was stoppered to mix the solution, the other student lighted a burner. The fumes ignited and my hair was burned. I smothered the flames with my own sweater. Fortunately I had only minor burns on my face and the hair grew back. (1109)

1162. After a 1987 chemistry lab was completed the students were writing up their results. One student did not turn off the Bunsen burner. Another student leaned over and singed her hair. (1138)

1163. During the late 1950's when girls were wearing elaborate hairdo's, heavy with lacquer we were running a lab in an eighth grade science class requiring the use of Bunsen burner. One girl leaned over the burner and her hair flared. Fortunately she was only singed and the next day came to class wearing a very modest and shorter hairstyle. (1155)

1164. In an introductory microbiology course in college a long haired female student turned her head to talk to her lab partner. The tip of her hair came in contact with the lit Bunsen burner. Her hair singed and it was patted out by her partner. (1194)

1165. A Junior girl came late to class while a lab was in process. She was warned at the beginning of the year to tie back her hair. She did not this time as she felt safe as she was only going to take notes for a four-person group.

Her hair was teased and "poofed". As she bent over her notebook to write, her hair ignited but fortunately was only burnt one side. She got a short cut for the next day. (1227)

1166. As a new eighth grade science teacher in 1967 I was going to demonstrate the equal and opposite force concept by making a rocket out of a milk carton. This demonstration came from the text we were using.

I was to fill the milk carton from the bottom with gas from the jets and then ignite the gas from a pin hole at the top. As we all waited for something to happen, we (I?) grew impatient and lifted the carton. It immediately erupted in flames that singed my eyebrows and shot up the sleeve of my blouse burning the hair off my arm. (1231)

1167. Curl enhancer on student's hair first period Monday morning. The girl leaned near the burner and her hair ignited. It was quickly extinguished. (1293)

1168. A twelfth grade female student in an Advanced Placement Biology lab was performing a bacterial inoculation. The long sleeve on her skirt caught fire as did her long hair.

Students had been told explicitly to tie back long hair and to roll up long sleeves when doing any work in the lab. (1303)

1169. In high school a female student bent over a Bunsen burner. Her hair caught fire. It was extinguished manually by her lab partner. (1403)

1170. A girl with long, fine blond hair (to her waist) was standing with her back to the lab table that had a burning Bunsen burner on it. The convention currents caused her hair to fly into the flame. (1428)

1171. A chemistry teacher in my school was in the lab with his students working with Bunsen burners. One of the female students with long hair reached across the table. Her hair caught fire. She started to run when the teacher reached her and put out the fire with his hands. Her hair had burned and his hands suffered slight burns.

The errors included long hair not tied back. The student starting to run which increased the rate of burning. (1473)

Other cases include: 1043, 1046, 1175, 1264, 1473

Haste

1172. Some rules don't sink in until you've actually experienced the situation they try to prevent. Preparation for a lab to be given was running late and I was hurrying to finish. Without thinking about the safety rule I measured the amount of concentrated sulfuric acid into a liter graduated cylinder and added water to dilute it to the required molality. As soon as I heard the sizzling sound of boiling water I realized my mistake and jumped back. Fortunately I was spared a shower of hot sulfuric acid. Well almost, my wool jacket developed a series of small holes in the arms and front during the next dry cleaning. I have never again made the same mistake. (1165)

1173. I was teaching a lab on leaf pigment chromatography in a biology lab in 1967. We had the students draw out glass tubing to make micropipettes to draw the lines on the paper.

I was behind my desk talking to a student from another class about her grade. Without looking, I reached for my rank book which was lying next to the tray containing paper. At the same time, a student reached for some paper, without looking, with the same hand holding a pipette.

The tiny sharp end penetrated the palm of my hand leaving three pieces totaling about 1.75 inches inside. Two pieces were easy to recover. The third traveled along a tendon and lodged up by the first knuckle. It was a long and painful experience.

The mistakes made: The paper should have been elsewhere. Everyone should have been looking at what they were doing. The student should not have been carrying the pipette around. (1209)

1174. I overheated the solution while diluting sulfuric acid and broke out bottom of beaker. I didn't have enough prep time and was hurrying. (1295)

Other cases include: 1144, 1357

Hazard Communication

1175. During a first year organic chemistry lab in college a student with very long hair was heating a flammable liquid over a flame instead of a steam bath. The student was unfamiliar with the substance which was poured out of a brown glass bottle that was only labeled by name. The chemical vapors did ignite and burn. Her hair was damaged but she did not suffer any other problems. It was a very thought provoking experience for me since I had carried out the experiment the day before using the same procedure. (1092)

1176. This accident occurred in 1986. My father was doing the annual cleaning of fence row areas around the farm. His usual procedure was to pour diesel fuel and burn. Someone had poured gasoline into the can without relabeling it. The fire ignited his clothing and burned his shoes completely. He suffered second and third degree burns over his legs. He spent thirty-six days in the hospital and suffered much pain. At the time of this accident he was 72 years old. He has problems with the heat bothering the skin grafts. (1125)

1177. A potentially serious accident that did not quite happen involved the mislabeling of reagent bottles. A bottle identified as concentrated sulfuric acid actually contained dilute acid. The addition of more concentrated acid resulted in a remarkably surprised teacher with a bottle of very hot acid on her desk. The bottle shattered from the heat but not until the teacher had placed it in a tray so that no leak occurred. The problem of incorrectly labeling is a constant concern of mine. I suspect that the increased use of chemicals by non-chemists will make the problem more serious. (1239)

1178. An artist friend in his printmaking studio took a drink from a bottle of Perrier and discovered he had a mouthful of acid used in etching. (1273)

1179. A professor at a local L.A. University moved an unlabeled bottle in the hood. It exploded and the professor lost his hand. The unlabeled bottle contained picric acid. (1446)

1180. In a San Bernardino high school during the school year 1987, a teacher was cleaning the lab. He thought the unmarked bottle, similar to a large pickle jar, contained beef tallow or fat used for biology experiments. He dumped the stuff into a sink so he could rinse the jar before throwing it out. But it wasn't tallow. It was volatile sodium metal in an oily liquid. As soon as the water hit, it exploded.

The teacher was taken to the hospital where doctors stitched up the gash in his abdomen and examined his eyes for debris. Something, possibly a metal fragment, injured his eye. His vision is still blurry.

Two days after the explosion, school officials working with county environmental health investigators removed all containers with sodium from the lab. School officials are still not sure how the sodium got there. They speculated the bottle might have been there since the closing of another high school. The material from the school that closed was divided among three other schools.

The gallon jar was a third to a half full of sodium metal. In high schools, sodium is used only in demonstrations in very small quantities to show its strong reaction with water. The explosion caused a small fire and forced the evacuation of nearly 2000 students.

The jar violated one of the principle rules of a chemistry lab--Never have anything in an unmarked container. (1461)

Other cases include: 1208, 1282, 1451, 1500

Hazardous Waste

1181. The most serious safety problem is getting rid of waste produced in experiments. (1301)

Other cases include: 1229, 1426, 1479

Head injuries

1182. Ninth-grade physical science students were performing a density lab using water displacement method. This was in 1985. During the lab a male student decided to call down the drain pipe of the sink located in the middle of his groups lab station. He stuck his head into the small sink. Another boy in his group jabbed him in the ribs. In response to the jab the first boy quickly raised his head and in so doing gashed the back of his ear on the pointed end of the faucet. Five stitches were required. (1432)

1183. October, 1980. Pendulum lab. A female student wearing a lovely white Angora sweater walked into the path of a swinging pendulum and got "bapped" with the bob. Result- minor head injury, lots of blood; colorful sweater.

Because suspension of the bob is most effectively done from the ceiling this may happen again unless a student is assigned from each lab group to be the safety monitor. It is a good idea to have a tennis ball surround any large weights. (1475)

Other cases include: 1082, 1106, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1225, 1433, 1498

Heating Alcohol

1184. A student was heating alcohol at a science fair. The alcohol burst into flames in the middle of the display with paper and card board around three sides of the pan. I grabbed the pan using my handkerchief and place the pan on the floor away from the projects. I then pushed the pan out the door with my feet. I burned my hand but avoided a major fire possibility . This was twenty five years ago when I was a student. (1377)

1185. The experiment was chlorophyll extraction using boiling alcohol in beakers win a water bath on a hot plate. One of the beakers tipped over spilling the alcohol. All the beaker burst into flame. Safety goggles were being worm and the fire was put out by a water bath. (1417)

1186. Extracting chlorophyll from leaves with a double boiler - alcohol in water bath, I poured more alcohol into the mix. A few drops landed on the open coils of the hot plate. The flame jumped into the can and the can blew up sending one-half gallon of flaming alcohol onto the floor. (1467)

Other cases include: 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1040, 1065, 1076, 1077, 1115, 1116, 1243, 1265, 1277, 1411, 1412

Home Accidents

1187. My daughter was out side with my husband while gardening. She saw a mushroom growing in the yard. Since we eat what we grow she naturally assumed she was free to eat it. When she showed her father what she had eaten he picked a few samples before he took her to the hospital. She was given ipecac while the hospital tried to identify the mushroom with out luck. We had to treat it as though it were poisonous. After treatment we had to watch her for up to a week for symptoms.

We now have a field key as well as telling our child never to eat without telling us. (1172)

1188. A mother drove into her driveway which slanted down towards the garage. She left the car in neutral and got out to open the garage door. The child in the car moved the gear shift and the car rolled. It pinned the mother to the garage door for twenty minutes until help came. (1353)

1189. While cooking, a pan on the stove started to burn. The mother removed the pan to a sink. She was going to put water in the pan. The kitchen curtains caught on fire. They were pulled down and water put on them. The father came in to the room and put a lid on the pan. Mother had minor burns on her hands. (1358)

1190. I left grease in a skillet on my stove at home. Result - $7000 damage. (1370)

1191. A woman came home one winter day and found her oven not working. She lit a match to ignite the oven. It was fueled by propane. The explosion destroyed the house and she lost her leg. (1376)

1192. A student, age fifteen, was home alone with a younger brother. He was cooking hamburgers and a grease fire occurred. The student removed the pan from the fire and dropped it in the sink and turned on the faucet. The grease spattered causing second degree burns on the student. (1383)

1193. The father was mowing the grass while the it was still wet from the morning dew. The lawn mower became plugged with wet grass. Without shutting the engine off the tipped the lawn mower on its side and began to kick at the blade with his shoe. He had been running the engine at a higher speed than normal because of the wet grass. As he kicked the blade it dislodged and threw the grass free. The tip of the shoe as well as the end of his big toe were cut off. (1387)

1194. A child was riding a tricycle which did not have rubber handle grips on the bars. The child fell with his eye against the open end of the metal handlebar. He cut the eyelid and muscles that hold the eyeball in the socket. Fortunately the optic nerve was not severed. The eye ball was hanging from the socket by the nerve. The child's vision was not impaired after surgery reattached the muscle and the eyelids. (1396)

1195. Flares were stored in the trunk of a car. While the father was repairing a tire along the roadway a child found the flares and pulled the strip to ignite it. The child was severely burned. The car caught on fire and was destroyed.

Flares should be kept in a metal container. Non-flammable safety signals should be used. (1406)

Other cases include: 1011, 1198, 1202

Hot Plate

1196. March, 1985. While working with an electric hot plate, two students were burned. The exercise required students to constantly stir and monitor a boiling solution. The students stirred with their elbows on the lab bench. The stirring lasted ten to fifteen minutes. Although nothing was felt during the experiment the burn increased almost like a sunburn. (1344)

1197. A student burned a finger during a lab where water was heated to boiling point on a hot plate. The burn was slight and it was treated with cold water. (1360)

Other cases include: 1033, 1090, 1115, 1185, 1186, 1231, 1338, 1412

Household Cleaners, etc.

1198. About thirty years ago at her home a young girl swallowed lye. The mother had stored the cleaning compound under the sink. The result after a rush trip to the hospital emergency room to be flushed out was permanent damage. She talks with a raspy voice. (1064)

1199. This story was told to me by my brother-in-law, who is a minister, so perhaps it is true. A woman was cleaning her bathroom. She used both ammonium hydroxide and Clorox cleaners. Wishing to do a good job she used both in the toilet. Her husband, a smoker, came in later to use the facility. He dropped a lit cigarette into the toilet bowl. The explosion broke one of his legs. As the paramedics carried him downstairs, they dropped him and broke his other leg. (1192)

1200. Refinishing maple tables in a closed cellar with a "zip strip" type of stripper the fumes made me very light headed with a drugged feeling. (1266)

1201. During the summer of 1986 I was using Easy Off Cleaner, lye, to clean my oven. The instructions said after using to wipe off the spray nozzle before replacing the cap. When I wiped clean the nozzle I sprayed the lye into both eyes. I immediately flushed my eyes with water for twenty minutes before going to the emergency room. (1368)

1202. A man was cleaning car engine parts in the basement with gasoline. There was a fire and explosion. Not only did it set his home on fire but he suffered first and second degree burns. (1375)

1203. An individual was cleaning the bottom of a boat with toilet bowl cleaner. He had no safety goggles on. The cleaner got into his eyes. He flushed them with water and needed emergency care. (1394)

Housekeeping

1204. The serious problem at this time is the middle school wood shop with flammable solvents all over the room and other clutter throughout the lab. The teacher himself is the most acute safety problem with his poor attitude and lack of regard for student safety. I was forced to close his facility last June. (1271)

Hydrochloric Acid

1205. A biology teacher in my school dropped a 2.5-liter bottle of hydrochloric acid. He immediately sent a student next door to the chemistry room. The teacher there, a former analytical chemist, grabbed a large bottle of ammonium hydroxide, rushed to the biology room and poured it onto the hydrochloric acid to neutralize it.

The room immediately filled with an acrid white smoke which then bellowed into the corridor.

At this time I was assistant principal and when I heard of the accident I rushed to the area to check. It was difficult to get into the room because of the smoke. Luckily this occurred at the end of the day so the students had cleared the area. (1031)

1206. When I took an organic chemistry course at St. Cloud, Minn., an instructor dropped a bottle of hydrochloric acid. He tried to clean it up and in the process breathed the fumes. He drowned in fluid secreted by his lungs. (1071)

1207. In a chemistry high school classroom a young lady wearing nylon stockings got some dilute hydrochloric acid on her leg. She either did not notice it or ignored it. A few periods later she noticed her stocking had dissolved and also some skin damage. She went to the nurse and said she had gotten concentrated acid on her leg.

The nurse, by-passing the teacher, immediately contacted the mother. The mother panicked and had the student taken to the hospital immediately. The police were called to transport her, complete with sirens blaring. Eventually the teacher was contacted and set the matter straight.

The result was much panic but little damage. (1232)

Other cases include: 1009, 1119, 1210, 1211, 1218, 1221, 1224, 1227, 1353, 1359, 1360, 1361, 1396, 1438, 1439, 1447, 1448, 1489, 1500

Hydrofluoric Acid

1208. In my first year of teaching I had an eleventh grade general science chemistry lab make Christmas ornaments by etching glass with hydrofluoric acid. The students were wearing goggles and aprons but not required to wear gloves. (It wasn't the practice in our school and I did not know better.) The lab went smoothly with no problems, the ornaments were nice. We cleaned up and all left the room.

Two periods later one of the students came to my room with redness and pain on the insides of both fore arms to the elbows and some on the hands. He was in quite a

lot of discomfort. He had gone to the nurse who sent him back to me for help since she needed to know what we were using. It seems the student had an acid burn. I was unaware of the delayed effects of hydrofluoric acid on the skin. I now read all labels and require gloves to be worn. (1158)

Hydrogen Generation

1209. In the late 1970's in an A.P. Chemistry class. The most serious accident that occurred in my class was the explosion of a hydrogen generator. The hydrogen was being produced to use as a reducing agent in the reduction of cupric oxide.

The set up (Masterton et. al.) called for a small jet to burn off excess hydrogen gas. As the student attempted to re-light the jet the flame traveled back to the generator and exploded. Goggles were worn by all students, no eye injuries. The only injuries were small cuts in and around the hands of the two students doing the lab.

This lab procedure is no longer used in the Masterton manual. (1007)

1210. One class period while teaching how to form certain gases using hydrochloric acid acid we started forming hydrogen gas which is explosive. We were using small test tubes trapping the gas under water in an over flow pan. I had four lab tables set. One student decided to use a larger flash and added more zinc metal increasing the hydrogen content and lit it. (1010)

1211. In a high school in Massachusetts around 1969 a lab was being done with twenty-eight students in the room. The students had produced hydrogen from zinc and hydrochloric acid. They would then use the hydrogen to determine its properties.

A student had a lighted Bunsen burner. He picked up a small gas bottle filled with hydrogen and passed directly over the burner flame. Instant explosion. No injuries, all students were wearing goggles.

The class size should have been much smaller. There should have been a gas switch shut off so that no burner would have been able to be used. (1173)

1212. When collecting hydrogen gas the student had one bottle and inserted a burning splint. The bottle shot up to the ceiling and broke. (1312)

1213. In a lab preparation of hydrogen, one student who received a dilute solution of sulfuric acid with a container of mossy zinc, diluted the dilute solution of sulfuric acid to such an extent that no hydrogen was produced. She then half filled the generator with mossy zinc, still no results. She then added sulfuric acid. All at once she obtained hydrogen and exothermic reaction to such an extent that the mixture boiled up out of the generator and produced so much heat that the generator melted into the table top. (1314)

1214. I was going to demonstrate a hydrogen bomb. This is a device to show that hydrogen gas burns and that you get an explosion with the proper proportions. I didn't have the proper container so I took a honey pail. I cut a small hole in the top and a larger one in the lid. I then clamped the can between two retort rings. I generated

some hydrogen using zinc and sulfuric acid. I had the correct proportions. When I lit the top the resulting explosion shattered the retort ring into three pieces. (1490)

1215. I was demonstrating the production of hydrogen with a hydrogen generator. The gas was to be lit after one minute. The flask was slammed to the desk. The stopper and tube went to the ceiling. No injuries but there could have been. (1495)

Other cases include: 1282

Improper Behavior

1216. Students in a welding class were spraying each other with compressed oxygen gas. One student was wearing a very loose acrylic sweater. A sparker a third student was using caused the sudden burning of the sweater causing severe burns on the arms of the student. (1061)

1217. About twenty years ago a high school sophomore had a habit of running down the hallway after lunch to go outside. When he kicked the bar on the inside of the door, his foot slipped off the bar and went through the "shatter" proof glass. His arm followed. Nearly cut his arteries. Blood everywhere. (1065)

1218. As my junior high class cleaned up after a lab in which they had placed hydrochloric acid on sea shells, I reminded them to pick up any spills and to rinse all of their equipment before they left. The bell rang and my next class entered. They would be doing the same experiment. I discussed the precautions to be taken with the hydrochloric acid and the importance of cleaning up spills. As they proceeded to the rear of the class a girl picked up an air piston, filled it with water and proceeded to use it as if it were a water pistol. She squirted one of the students in the eye with what she thought was pure water. Great joke until he ran to the faucet to rinse his eyes. He was not seriously injured but it was a little scary. (1066)

1219. A group of chemistry students were using Bunsen burners. They had all used the burners before, and had been instructed on their use. One pair of students had been having difficulty igniting their burner, and as it turns out, had been lax in shutting off the gas between attempts. Also their connection between the tube and burner was not tight.

When I arrived with a different starter the spark caused an area fire as the cloud of gas went up and the Bunsen burner shot across the room. I grabbed the tube and held it while I calmly instructed a student to turn off the gas.

No one was injured. I now inspect all apparatus before giving the go ahead. (1068)

1220. An alternative education teacher at school borrowed chemicals and glassware to do an acid-base neutralization lab with one of his students. Having been told that the product was salt and water the student drank some of the liquid. To support (!!) the

student the teacher then drank some too. Neither suffered any apparent ill effect fortunately. (1069)

1221. In 1980 in a high school chemistry lab doing a lab using 6M hydrochloric acid. The acid was in dropper bottles and clearly marked. Two large boys decided to "accidentally" squirt each other. They did not tell the teacher, probably because they were playing. They did not say anything until after they started to hurt.

We had no shower and only the week before one sink was equipped with a dishwasher sprayer attachment to use as a temporary shower. Both boys removed their shirts and leaned into the sink. We rinsed for 20 to 30 minutes until their parents arrived to drive them to the hospital. One of the boys was scarred from the accident. The doctors supported what the teachers had done. (1114)

1222. During a grade ten general science lab a student threw acid onto another student. This was in 1973. The teacher was a physics teacher who did not want the class. It was in Charlotte, North Carolina during integration. This was a basic class filled with students who had been bused in. The teacher had a hands off attitude. Fortunately the student was not hurt. (1204)

1223. "Youth Strikes Back". Youth was mucking about with some aluminum powder. I can't remember now exactly why. Anyhow, it seemed like a good idea at the time. Youth decided to do a spot of unofficial experimentation on its own. Found out you can get lovely sparks if you put heated tongs into the open top of a can of aluminum powder. Found out belatedly that you can set fire to the entire contents of the can by putting heated tongs into the top of it.

Fortunately the “oohs and ahs” of nearby students alerted me to what was going on. I got to the scene just in time to prevent youth from pouring a beaker full of water into the can to put the fire out.

I placed a heatproof mat over the top of the can in an attempt to stop air from getting in. It took about 20 minutes for the fire to go out. By this time several teachers had looked in with various suggestions about how to deal with the problem. It took us all some time to realize the bench under the can was smoldering and we had to get that put out too.

Nobody thought of using sand. The moral of course is to grow eyes in the back of your head. I still haven't learned my lesson. Only a week after the aluminum incident I just managed to stop a kid from picking a piece of calcium out of its container with a pair of hot tongs.

Then there's the time a kid was heating potassium chlorate (V) in order to convert it into chlorate (VII) plus chloride. It exploded in a spectacular orange flash of chlorine heptoxide. The crucible he was using was dirty. (1253)

1224. In a junior high eighth grade earth science class the students were testing for carbonate minerals with hydrochloric acid. After viewing the reaction a student decided to test the ring on his finger for the same reaction. Acid was dilute enough so that the student was not hurt.

My question: Why would anyone after seeing the chemical reaction want that same reaction to happen on his skin? (1263)

1225. I was riding my bike and a passenger in a car coming from behind me threw a full can of coke and hit me on the side of the head. Luckily it hit me square and not on an edge. It hit the outer ear lobe protecting me from more serious damage than a bruised cheek. (1267)

1226. A friend's sixteen-year-old daughter was standing on the street corner waiting for the school bus. A gang of boys came driving by with straws and peas. They shot their shooter into the crowd. One hit her in the eye. She lost the sight in that eye. (1331)

1227. In 1985 in Bellarmine College during an organic lab my classmates and I were instructed to clean up the lab. One student asked to use a sponge from another student who tossed the sponge to him. The sponge knocked over a bottle of hydrochloric acid which splashed all over the student. He ripped his shirt off and flooded his chest with water. While there were no injuries we all should have been wearing lab coats and goggles during clean up. (1440)

Improper Disposal

1228. In the fall of 1964 at Broward County Community College in Florida a trough fire in general chemistry class occurred when one student threw a match in the trough after lighting his Bunsen burner. A student at the opposite end of the long chemistry work table poured a flammable liquid down the trough without flushing with water. The result was a table length raging fire. There was moderate damage and minor burn injuries. (1035)

1229. As a high school junior in chemistry class I was working with an eighteen-inch thermometer. The teacher was at her desk while the experiment was taking place. There was no instruction in the use of the thermometer. The thermometer broke as I was shaking it down. The teacher instructed me to pick up all the pieces, including the mercury, and deposit them in the waste basket. (1414)

Improper Equipment

1230. During my first year of teaching, a freshman in my general science class was heating test tubes inside a beaker of boiling water using a lab burner under a ring stand.

Fortunately the student had done everything correctly with one small exception. He had selected a ring stand with a small round base. The student was adjusting the test tubes when he jarred the stand. This knocked the entire apparatus off balance and as it began to fall forward he instinctively tried to catch it. He succeeded in catching it but just for an instant. He suffered minor burns on his fingers but his apron caught all of the boiling water and hot glass.

This accident would have been difficult to prevent since the actual cause was his reflex reaction. However, I did become aware of the instability of these antique ring stands and no longer use them. (1177)

1231. At the Alpha Dairy, Red Deer, Alberta, ether was being evaporated from a flask using a homemade steam bath that consisted of a hot plate with a metal dish on top. This dish held the water as well as the flasks. This steam bath was then positioned under the fume hood which was a kitchen range fan. On the day of the accident one of the lab employees set up the steam bath but neglected to turn on the fan. Ether vapors quickly accumulated and the heat from the hot plate was soon hot enough to ignite the vapors. The fire was contained using an available fire extinguisher but the room suffered considerable damage.

Errors were using an unsafe steam bath, using a range hood instead of an approved fume hood.

A proper fume hood would have contained a fire better and the employee should have checked that the fan was on. (1248)

1232. In a college lab in 1973 the rubber end of a pipette did not fit well. It fell into a bottle of acid. The student moved the acid to the hood to prevent any further damage. (1324)

1233. This happened at a college in Connecticut in September, 1988 in a general chemistry lab. Students were producing potassium aluminum sulfate (alum) by recycling an aluminum can. The first step is to cut a piece of the can into small pieces, add 50 ml of 1.4M potassium hydroxide and warm gently with a Bunsen burner.

One student had set her 250-ml beaker with 50 ml of 1.4M potassium hydroxide on a wire gauge on top of an extension clamp instead of a ring clamp. Both clamps were provided, as the extension clamp was needed later on. The extension clamp melted causing the beaker and contents to fall, bounce once on the lab bench, once on the student's leg and shatter on the floor.

Luckily the student was wearing pants. I told her to go to her dorm room immediately, get out of her pants and thoroughly clean her leg with lots of water. After that to rinse and let her pants soak. She came back later with a small reddish area but no pain or serious damage.

The extension clamp is a Fisher product and has "cast alloy" stamped on it, which obviously will melt at Bunsen burner flame temperatures. This caused the beaker to fall.

My lesson was learned--be sure students know the names of all apparatus they will be using. (1462)

Improper Equipment Setup

1234. In a college lab a large apparatus was set up to boil liquid. The teacher left to assist another student, the apparatus fell the glass and liquid ended up on the table, floor and another student's arm. (1363)

Improper Procedure

1235. In college, working with steam distillation of flammable organic material, one of the students began the lab using an open flame. Some of the material caught on fire. He panicked and knocked over the distilling flask and set the counter on fire.
He had not been paying attention to the reminder from the lab instructor, nor had he been terribly well prepared by pre-reading the lab procedure. The lab was evacuated for twenty minutes while the fire was dealt with. (1003)

1236. Student tasted an unknown acid by placing her finger in the beaker and on her tongue. (1011)

1237. A biology major taking organic chemistry was performing an experiment. In the procedure he had to prepare a solution of sulfuric acid. Not mixing the acid and water in the proper fashion resulted in the acid flashing back onto his chest. The concentrated acid ate through his lab coat and ruined his sweater. Fortunately he was not injured. The cause may be attributed to his carelessness in rushing to catch up. In a college lab supervision is often minimal. (1033)

1238. This happened in 1982, the first year I taught chemistry. Being a biology major and having previously taught at the Jr. College level I was not thinking ahead enough to realize that eleventh grade students don't always hear instructions or remember them.

We were doing the element mixture and compound lab with iron filings and sulfur, where the elements are mixed and combined. The mixture and new compound were to be mixed with carbon disulfide, which was to evaporate near windowsill, leaving the sulfur or iron sulfide.

Some more thoughtful students wanted to speed up the rate of evaporation so they decided to heat the carbon disulfide in its evaporating dish. It quickly caught on fire, someone screamed and threw the burning liquid and evaporating dish across the room. The room quickly filled with smoke. We had to be evacuated.

The story now gets told and retold every year but I also omit that part of the lab because of the dangers of carbon disulfide. (1102)

1239. During a laboratory activity in Qualitative Analysis a student in the class was given an unknown solution to identify. The student was a party animal and spent as little time as possible in the lab. The time for handing in the laboratory write up and identification of the unknown substance was fast approaching. To avoid doing all the tests for the unknown the student decided to use the sniff test. I might add he did not use it correctly. He stuck his nose too many bottles. One of these chemicals blinded his left eye.

I use this true story in my lecture as I teach safety techniques during the beginning of the year. It gets the students attention and helps to illustrate the importance of using safety procedures in the laboratory. (1110)

1240. In an eleventh grade chemistry advanced class around 1982, a student picked up a full liter of 1M sodium hydroxide. The solution was in a fleaker bottle. The top of the fleaker just pops on and off. They do not screw on. The student picked up the sodium hydroxide by the top. The bottom dropped. Glass and sodium hydroxide went everywhere. The student was wearing apron and goggles. (1113)

1241. In a high school chemistry lab in 1986, after the students were instructed on lab procedure and safety precaution for the lab, they went to the supply table for the chemicals. One student picked up a dropper bottle of NH3 and water by the dropper. The bottle fell away from the dropper; the student bent down to catch the bottle and reached it as it hit the floor. The chemical splashed and hit her in the face.

She immediately went to the eyewash and flushed. We then sent her to the hospital to be checked. (1116)

1242. An eleventh grade girl removed her goggles as she was cleaning up. Dilute acid was splashed in her eyes. Eyewash used, no damage. (1175)

1243. In a small school in central New York in February of 1988 an eleventh grade general chemistry class was doing an oxidation of alcohols lab. They were at the second stage and investigating strong oxidation of ethanol. The experiment calls for one gram of potassium dichromate in the bottom of a test tube, five mls of water and three drops of sulfuric acid. This is to be gently heated to about 65 degrees C to make an oxidizing solution into which ethanol is added drop by drop. The directions call for boiling stones in the test tubes and these were out and available with the other reagents on a centrally located lab bench.

One student forgot to add the boiling stones. He was also very careless about heating the test tube over the flame. Since the test tube was not stirred well before heating some of the potassium dichromate was in the bottom of the tube. On strong heating the test tube in effect became a blowgun. The entire contents ended up on the ceiling and caused quite a commotion. No injuries resulted, goggles were worn; shirt sleeves were stained. (1188)

1244. An instructor cut off his little finger on the table saw. This took place in June, 1984 as he was ripping a piece of lumber. This particular instructor is very reckless with tools. He does not follow proper procedure in the use of power tools. The accident was the result of carelessness and a rush to get the task done. Even after the trauma of that accident his work habits remain the same. (1272)

1245. In high school a student stuck pennies in concentrated acid. They inhaled the vapors and went to the nurse after for headaches. (1336)

1246. Around 1972 in a college laboratory a student directly smelled a liquid and then passed out. The chemical spilled on her upper body and face. It left scars. (1345)

Other cases include: 1372, 1404

Incompatibility

1247. A non-science teacher in 1979 was sharing with his students exciting occurrences that happen when chemicals are mixed. One example involved the pouring of alcohol into a beaker containing sulfuric acid. Later in the week two of the students were able to enter the laboratory and poured an unknown quantity of concentrated sulfuric acid into a beaker followed by ethanol

Fortunately the fire was contained in a sink and the students were not injured. (1124)

1248. In 1965 when I was a senior in high school some students stockpiled chemicals in their lab pit. One day near the end of the year they mixed them together in a sink. Concentrated lye and concentrate acid splattered. Luckily there were no injuries. (1369)

Other cases include: 1172

Inhalation Exposure

1249. A student was transferring a powdered reagent from glazed paper to a test tube. Some of the powder stuck to the paper. Student tried to blow the powder off and in doing so inhaled the reagent into his mouth. (1176)

1250. In 1969 I was trying to impress on a general science class the problem of air pollutants and decided to prepare some of the more common types. After preparing the gases in a hood I asked student volunteers to sample the gas and describe the smell. I took pains to describe the proper method for bringing small amounts of gas to the nose. Everything worked well until the last gas which was a common pollutant but one I had never had occasion to make in the lab. Sulfur dioxide had some properties which I wasn't aware of and as the generator bubbled away I had the student pass her hand over the flask to sample the gas. After three attempts to do it the right way the student exclaimed to the class the gases weren't that bad and she proceeded to put her nose over the flask and inhale just as the dense Soxygen gas reached the top. She turned paper white and fell. I caught the generator. She recovered but was slow to volunteer again. (1206)

Other cases include: 1011, 1014, 1052, 1132, 1206, 1245, 1271, 1353, 1401, 1447, 1475, 1497

Iodine

1251. A ninth grade class of low reading level students in physical science was examining different metallic properties. The lab called for heating a small amount of

iodine. Each student was given a tiny bit of three or four crystals to heat in a beaker. When the reaction was observed one boy decided he liked the purple vapors and while I was working with another student took a larger amount and heated it. It caused vapors to fill the room. Two boys were excused complaining of headaches. Several others had eye irritation, throat burning and other minor problems. It gave me a scare. They were wearing safety goggles. (1144)

1252. During a biology lab iodine stain was set out on the lab bench for staining onion epithelial cells. The teacher neglected to pour it into smaller beakers for easier handling. The iodine stain tipped over onto the lab bench where there is still some permanent staining. Her clothes had to be trashed as she was not wearing a lab coat or apron. (1195)

1253. We were working on an introductory lab staining onion with iodine. During the course of the lab a student placed drops of iodine on the eyepiece of a microscope. Needless to say a student then used that scope. (1489)

Other cases include: 1346

Iron Ring

1254. At Fitchburg (Massachusetts) High School in 1983 while working in the Physics lab we were doing a standard lab on transformation of potential to kinetic energy using a large spring and steel mass. Iron rings from a ring stand were used as distance markers. Student noticed that one of the rings was slightly bent so he proceeded to push it up to straighten it out. As a result the iron ring snapped off and his lower forearm received a six-inch gash with profuse bleeding. I was standing two feet away working with another student. I turned around when I heard the snap and saw the student with his arm covered with blood. (1259)

1255. Most of the accidents I have had in over twenty-five years as a chemistry teacher have been cut fingers or burns from hot rings. We have a vigorous safety program but the program is only as good as the people who are involved.

I have had very cooperative students and good fortune. (1292)

Other cases include: 1040, 1047, 1099, 1230, 1233, 1310, 1366, 1367, 1395

Lack of Attention

1256. An experienced science teacher, while teaching from the laboratory table at the front of the room, feels a burning sensation on her forearm. She absent-mindedly puts the burning area in her mouth and discovers a very sour taste. (1277)

1257. Students also forget that they might have gotten some chemicals on their fingers during an experiment. They rub their eyes afterward and panic sets in. Eye washes have been available for these problems but perhaps it means goggles should be worn for all experiments where irritant chemicals are being used. (1308)

1258. In 1959, I was student teaching. A student neglected his own experiment when he started watching an exciting step in an other experiment being done near by. His own experiment exploded injuring about twelve students. (1367)

1259. During a college laboratory in chemistry, I somehow got acid on my jeans. I was not aware of this until the jeans were washed and I had some large holes. (1392)

1260. During the 1984-85 school year a student, wearing goggles, put his finger in his eye to itch it. His fingers must have had some dirt on them. Soon his eye started to burn. I have learned to warn students about this. (1423)

1261. A teacher put away a portable Bunsen burner with the flame still going. The paint on the metal shelves burned. (1468)

Lack of Emergency Equipment

1262. A Junior chemistry student was doing a lab experiment in a class of about 15. Using acid which was heated the student dropped and broke the container spilling hot acid on himself. He had on goggles and an apron which protected him for the most part. Another student informed me and I immediately took him to the back room, took off his shoes and socks and place his legs and feet in the sink. No shower was available. I flushed him with water, sent for the nurse who sent him to the hospital. No damage. (1036)

Lack of Information

1263. In the classroom where an experiment was being done, a piece of burning paper was near a flammable liquid, kerosene. There was no water near. An explosion could have happened. If a pan of water had been near the paper could have been tossed in the pan extinguishing the fire. (1413)

Lack of Instruction

1264. During a chemistry lab this past September, 1987, a student of mine, in an attempt to turn off her Bunsen burner, turned on the gas jet in the adjacent lab station. Since her burner was placed close to the jet, the escaping gas ignited and sent a two-foot horizontal stream of flame toward the student. The student froze so the gas was

not turned off for several seconds until I could reach the lab area. Fortunately singed hair on the top of her hand was the only damage which occurred. The student started school one week late and I had failed to update her on lab safety procedure which the rest of the class had experience during the first week of school. (1017)

Other cases include: 1327

Lack of Supervision

1265. The science teacher working in the classroom next to me opened his storage room door to get a can of alcohol. He was using an alcohol burner to show students that hot air expands a balloon. A student sneaked behind his back and grabbed another can, called two friends to see what was going to happen when he dropped a lighted match into the can. All three were hospitalized. The school board was sued. (1013)

1266. In South Carroll High School during the homeroom period early in the day, a non-science teacher was on duty in a chemistry room. Two male students horsing around at a lab station splashed water at each other. One student picked up an unlabeled beaker with 6M sulfuric acid and threw it on the other students face. The results were scarring, sight loss, and a legal decision that has taken over eight years. It was settled out of court. (1037)

1267. In 1987 in a twelfth grade chemistry II class, students were working independently on Qualitative Analysis. They had access to the stockroom. One student was trying to make gunpowder and mixed potassium chlorate and sulfur in a mortar and pestle. It exploded.

There was a major loss of blood, loss of the middle finger and possible loss of use in left hand. The student was not wearing safety goggles or protective clothing. (1097)

1268. In Louisville, KY some students had gotten together in a chemistry lab and decided to make a large container of hydrogen gas. They had made a small test tube in their regular lab earlier. They supposedly used a battery jar to collect the hydrogen gas and conducted a splint test. The corner of the lab was blown out and two students were killed. Why they were in the lab unsupervised no one knew. (1100)

1269. In 1969 my husband and I were building a cabin on Lake Sinclair in middle Georgia. The porch had been laid out about five feet off the ground and the joists were up but there was no flooring down. Our two-year-old daughter fell off the structure striking her foot on a piece of sheet metal that was stored under the porch. Six stitches were required to seal the cut.

The metal of course should have been stored in a safer place and probably a two-year-old should not have been unsupervised around a construction site. (1131)

LEARNING BY ACCIDENT

1270. When I was in high school one of my friends was very interested in chemistry and spent time helping the chemistry teacher. He was a very intelligent, very curious student. One afternoon he went into the lab and, without the teacher's knowledge, got some phosphorus from the stockroom and planned to experiments with it. He didn't get far. There was a loud explosion. We heard it on the soccer field with the coach who was also the chemistry teacher.

My friend has many small scars on his face and neck and probably would have been blinded except that he wore glasses. He lost parts of two fingers on his left hand. (1164)

1271. An undergraduate student at Central Connecticut State University in New Britain synthesized a toxic gas in the lab which leaked out into the hall on the fourth floor. It was reported on the evening news as phosgene gas (although it seems to me that I had heard it was similar to this but not actually phosgene). The building was not overly crowded but was evacuated. One or two students had to be brought to the emergency room for mild inhalation effects.

It is my understanding that the experiment was unsupervised and the side product was not anticipated. This occurrence shed light on the rather faulty venting and hood system installed. (1296)

1272. In 1964 a seventh grade science student was asked to take a make up test in the storage room. The student finished the test early and began to explore the materials in the room. He took bottles and smelled each until he took a good strong sniff of ammonia. (1326)

1273. In 1980 a substitute chemistry teacher allowed two students to work alone in the lab. The students made gunpowder. One student had made a small cannon in metal shop using soft white metal. The students set off the cannon which exploded and blew off one of the boys hands. (1334)

1274. A student was amazed by the experiment on oxygen production from potassium chlorate and manganese dioxide. He asked permission to repeat the experiment after school. He secretly mixed potassium chlorate, manganese dioxide, sulfur and phosphorous in a beaker. He dropped in a lighted match. The flame produced burned the back of his hand. The skin came off. He had plastic surgery and his hand finally recovered. Fortunately the parents blamed their son and there was no law suit. The experiment has been dropped from the course. (1361)

1275. High school students were mixing chemicals at random. The result was an explosion, injuries and death. (1397)

1276. We were working with fruit flies for genetics. While working with ether on their own time, one of the students became ill. There was no supervision and not enough instruction about the use of ether. (1412)

1277. There is a lab in biology in which alcohol is heated in a water bath in order to extract pigments from freshly crushed leaves. The lab specifically states to put the alcohol into a beaker with the crushed leaves. Then to place the beaker into a water bath and then to heat the bath gently raising the temperature of the alcohol so that the pigments could be extracted. A warning is written into the lab stating the fire danger.

A high school student placed the alcohol directly into the bath and heated it. In the process of pouring the alcohol into the bath a few drops dripped onto the table top. The vaporized alcohol soon ignited setting a fire the alcohol on the table.

The student attempted to extinguish the small fire by beating it with a towel. Due to an inaccurate swing, the entire contents of the bath were spilled, thus adding fuel to the fire.

The flames were extinguished with a conventional ABC extinguisher. Lack of proper supervision and a disregard for directions were responsible for this accident. (1452)

Ladder

1278. A man painting a high cement wall on the school grounds was using an extra long ladder to reach the top of the wall. Rather than climb down the ladder he tried to jump it to the next part of the wall that needed to be painted. (1260)

1279. I was cleaning gutters around the house on a stepladder. The small legs of the ladder sunk quickly in soft ground. I ended up upside down on an evergreen plant. Luckily I was not hurt. (1405)

Lead

1280. Professor Gerald Walker, Professor of Physics at Cleveland State University is famous for his demonstrations. Recently, he has been on the NBC nightly news with Tom Brokaw and on the Tonight Show with Johnny Carson.

One experiment he does is to dip his wetted hand into a pot of molten lead. When he did it on TV he apparently managed to splash molten lead onto his clothes creating a fire hazard.

I did not see the program but it was shown on the air. (1235)

1281. My son heated lead in a pan to a molten condition. He was going to pour it into a hole in a front porch concrete hole to seal an iron post in place. When the molten lead hit the cool concrete it exploded from the hole into his face. He was not wearing goggles and received burns on his hands and face but did not lose his eye sight. (1359)

Lithium

1282. During my graduate days I once had to synthesize a methyl lithium solution in tetrahydrofuran. The procedure for making this solution called for reacting lithium wire with methyl iodide in tetrahydrofuran. The reaction proceeded smoothly and the resulting methyl lithium solution was removed from the reaction flask using pressurized nitrogen and a cannula leaving behind about five grams of unreacted lithium wire.

The procedure for taking care of the excess lithium called for reacting it with ethanol to form the ethoxide which was then reacted with water and dilute acid to produce an innocuous aqueous solution.

Blindly grabbing a laboratory squirt bottle labeled "Ethanol", I started the quenching reaction only to notice flames developing and an obviously rapid reaction starting.

I was able to pull down the sash of the hood just in time. This violent reaction coated the inside of the hood with lithium oxide powder, vaporized the Teflon off the magnetic stir bar inside the reaction flask and melted the bottom of the three necked reaction flask fusing it to the ceramic top of the magnetic stirrer unit.

It turned out the squirt bottle labeled ethanol contained water. This proceeded to react with the lithium producing lithium hydroxide, hydrogen gas and considerable heat. The heat ignited the residual tetrahydrofuran and the explosion occurred.

Obviously correct labeling could have avoided this accident. Reuse of containers for other materials should not take place. (1444)

Magnesium

1283. In an experiment in which magnesium metal combines with oxygen gas to form magnesium oxide, one of my students had a crucible explode. Pieces of porcelain flew in all directions burning a hole in our wooden cabinet and getting the linoleum floor on fire. The fire was extinguished with the fire extinguisher. Luckily no students were burnt or injured. (1279)

1284. I heard that at NSTA conference in Saint Louis a demonstrator was showing the dry ice block reaction with magnesium. Shakable's manual advises using magnesium dust and potassium chlorate to ignite the magnesium. There was an explosion and they carried the demonstrator out on a stretcher. (1465)

Other cases include: 1321, 1476

Melting Point Apparatus

1285. The heater on a melting point apparatus was not turned off. The oil bath became so hot that the bulb of the thermometer burst. Mercury droplets were everywhere due to the force when the glass broke. (1251)

Other cases include: 1331

Mercury

1286. A college student spilled mercury on the lab floor and attempted to clean up with a vacuum cleaner. The heat from the motor vaporized the mercury. He should have spread sulfur on the floor and swept up the compound. (1342)

Other cases include: 1295, 1397

Mercury Thermometers

1287. In a low-average ability eighth grade glass while demonstrating the effect of salt on boiling water a student touched the mercury thermometer to the hot tripod. The bulb exploded scattering Hg. This was not done under a fume hood. Students were removed from the area. The teacher should have used alcohol thermometers. (1046)

1288. January 1988 one of my students dropped a mercury-filled thermometer onto his lab station. When the thermometer broke it scattered glass and mercury onto the tabletop. The lab partner told him and others not to touch it.

I, the instructor, cleaned the table and the floor with wet paper towels. Then place all the towels in the trashcan.

If I had been more knowledgeable I would not have used mercury filled thermometers, but alcohol-filled instead, and I would have known how to properly dispose of it. (1086)

1289. The most common accident in labs is mercury spills due to thermometers breaking. (1249)

1290. A student leaned over to check the lab manual and at the same time knocked off a mercury thermometer. The thermometer broke and contaminated the lab with mercury. (1418)

Other cases include: 1229, 1285

Microbiology

1291. A sophomore college level microbiology class was instructed by a graduate student. During the lab we were to collect several different types of microorganisms to put on Petri dishes, allow to incubate and then identify them during the next lab session. The procedure was to put wire loop into the bacterium medium and spread it across the dish. A student during the lab, not realizing what was happening, would put the wire

loop into her mouth after dipping it in each solution. The graduate student did not notice her actions until she had inoculated herself with two different types of bacterium.

She became very ill and never returned to the lab. We learned later that she had spent some time in the hospital.

The next lab session we had was spent exclusively on safety procedures, with the department head conducting the class. (1082)

1292. In Biology lab when we were studying bacteria a student reached across the lab table and spilled the bacterial fusion. Clean up was messy but no one was hurt. (1439)

Other cases include: 1039, 1047, 1092, 1138, 1164, 1253, 1293, 1294, 1407

Microscope

1293. My first year at Fitchburg, 1967-68, a biology sophomore student focused a microscope (mirror type) in the direct sun light. He screamed and I took him to the nurse. No permanent damage but the grasshoppers legs were burned to a crisp.

I tell this to all the students to date even though we have artificial light built into all our microscopes. (1270)

Other cases include: 1092, 1253

Microscope Slides

1294. The worst accidents I've encountered have been broken glass slides. I find it best to have the slide at assigned microscopes and not allow the students to walk with them. (1265)

Other cases include: 1138

Mouth - Aspirating or Pipeting by

1295. In Montville School in September, 1975 a first year Physics teacher was in the process of having his students make a J tube type of manometer. The students were to aspirate a small amount of mercury into the tube by mouth. A young lady placed one end of the J tube in her mouth and the other end, which was attached to a rubber hose, into a pool of mercury and sucked mercury into her mouth. I was department chairman at the time and had advised the teacher not to perform this activity. I was across the hall at the time and when I was informed of the accident I directed the student the nurse. (1018)

1296. A fellow student in an undergraduate chemistry laboratory in college sucked a small portion of concentrated sulfuric acid into his mouth while using a pipit. He immediately spat out the acid, rinsed his mouth with copious amounts of tap water, then held small amounts of bicarbonate of soda in his mouth for a period of time. He went to the health center for an examination. Fortunately there was little damage. (1043)

1297. A junior pipetted 6M sodium hydroxide into her mouth. (1054)

1298. While working at a clinical laboratory a fellow employee was pipeting a dilute chemical solution and it ended up in her mouth. She should not have been pipeting by mouth. Always use pipette bulbs. (1067)

1299. As an undergraduate student in a college quantitative analysis course in 1964 I had an accident with a pipet. I was using a 6M solution of sodium hydroxide in a titration experiment. In transferring the sodium hydroxide I used a pipet. There were no rubber bulbs in the lab and I used suction by mouth technique to fill the pipet. I happened to over fill the pipet and got the 6M sodium hydroxide solution into my mouth. I rushed to the nearest sink and rinsed with water. Mouth tissue was lost in the process.

I have not used the mouth to fill a pipet since. (1107)

1300. While working at the Medical College of Georgia my boss, who had his MD and PhD, mouth pipetted concentrated sodium hydroxide. Some got into his mouth. He set speed records getting to the sink. (1112)

1301. In 1973 while working at the Medical College of Georgia a friend was mouth pipeting radioactive material and swallowed some. (1139)

1302. In a college chemistry lab my lab partner pipetted concentrated acid into his mouth. He tried to neutralize it, in his mouth, with lye. Severe oral damage. (1371)

1303. A friend in the University used a pipette to transfer sodium hydroxide. He used his mouth rather than a bulb to draw in the liquid. He swallowed a mouthful of the sodium hydroxide. (1500)

Other cases include: 1362

Nitric Acid

1304. Twenty years ago my supervisor put a two and a half liter bottle of concentrated nitric acid on a lab table. He did everything with a flourish and consequently put the bottle down a bit hard. When he picked up the jar later the bottom seam was damaged and acid poured all over his lower body dissolving his clothes and shoes. He received severe burns and the scars remain today. (1050)

1305. In a quantitative analysis lab with juniors in college around 1970 one person in the lab was severely burned when a beaker of nitric acid spilled and got onto her hands. She panicked and did not know what to do. Considerable time elapsed before she put her hands under water. The result was third degree burns.

Prevention should have included better knowledge of safety; the graduate assistant could have come to her aid faster. There was water nearby but members in the class did not respond quickly. (1085)

1306. In undergraduate college, a student was given a collection of chemicals. Special notice was given to the fact that concentrated nitric acid was part of that collection. She was a loud talker. Either she was not paying attention to the warning, or was talking and not paying attention to what she was doing. The acid was knocked off to the floor and broke. It splashed onto her legs. She was taken to the nearby showers. She has scars that resulted from the burns. (1091)

1307. In an organic chemistry lab in Auburn University in 1983, a student was handling concentrated nitric acid during a synthesis reaction. Apparently some of the acid had dripped on the outside of the reagent bottle. After an hour the students hands started itching severely. She placed her hands under water and experiencing severe pain and burns. She suffered second degree burns on both her hands. This required her hands to be wrapped and treated for two weeks. (1120)

1308. After a couple of years of teaching chemistry and becoming almost fanatical on the issue of safety I was made aware of the over kill results one morning. The second year chemistry class was conducting the quantitative analytical scheme and had arrived at the copper - arsenic group. One very careful and conscientious student was wearing long sleeves which slipped up over his wrist and exposed a very serious burn. When I commented about it, he confessed to spilling 16M nitric acid on his wrist and it was trapped under his watchband. He wouldn't tell me about the spill because he thought I would be mad. (1121)

1309. A teacher reached up on a shelf on which there was a leaking box. The box broke covering him with a large amount of concentrated nitric acid. By the time he reached the restroom his suit was nearly gone.

No shower was available. He was sent to the hospital with third degree burns. (1146)

1310. This happened about fifteen years ago while pipeting nitric acid using sodium nitrate and sulfuric acid. A glass retort containing sodium nitrate and concentrated sulfuric acid had been heating. The collecting of the nitric acid occurred in the test tube in the second ring stand.

The reaction had ceased or waiting to go. I was assisting the group to separate the apparatus.

I had the stand with the test tube and nitric acid. I asked the student to my right to move away and to separate the two apparatuses.

I moved to the left and an eruption occurred. She apparently moved to the left with me and sealed the end of the retort at the bottom of the test tube building up pressure which when released blasted the nitric acid out of the test tube.

We were wearing goggles and aprons. My sleeves were rolled up. The student did not get any on her skin but I got some on my face and right arm.

I immediately went to the sink and rinsed it off. One drop was big enough that the scar is four inches long.

I know make sure the students understand instructions. I ask them to repeat the instruction. (1207)

1311. In an eighth grade ISCS chemistry class about ten years ago a young woman was using concentrated nitric acid as part of an experiment. The teacher followed all safety precautions. The students were constantly made aware of safety and safety was an integral part of the class. In this experiment the nitric acid was in a special box with its own dropper apparatus.

The young lady was holding the bottle of nitric acid as she was adding the acid to the solution. She was so excited by the reaction and its results that she panicked and jumped. The nitric acid splashed down her blouse and settled in her bra. She was wearing goggles and rubber gloves. (1218)

1312. A 2.5-liter bottle of fuming nitric acid was stored in the Styrofoam containers used for shipping acids. On a hot summer day one of the bottles broke. The oxidizing nitric acid ignited the Styrofoam. The fire caused some damage to the lab. Luckily someone heard the bottle crack and the fire was extinguished quickly. (1242)

1313. In 1976 in a Fitchburg, Massachusetts junior high a grade nine pair of students working in an I.S.C.S. lab. learned the caustic effects of nitric acid. After reviewing the safety rules of using an acid in the introduction of the lab, the class was working in teams at their own pace. One team finished the lab early and decided that my comments on the effects of the acid were overly stated. They used the medicine droppers to write their initials on the knee area of their blue jeans. In a few minutes they left for the next class without anyone being aware of the potential problems.

A phone call from the office forty minutes later revealed they were feeling a burning sensation on their legs. On checking the students each had severe third degree leg burns from the knee to the ankle that needed emergency room attention. Permanent scars were present in each case. The jeans fell apart in the next wash. (1264)

1314. A splash of concentrated nitric acid into the face of a student in an eighth grade ISCS classroom. The student was wearing goggles but the face around the area was burned. Safety instruction had been given. Goggles and aprons were being worn however several safety procedures were not followed.

The small dropper bottle was picked up and subsequently dropped. A face shield was not worn. The safety shower was marginally adequate. The lab was very over crowded. This experiment should be eliminated in grade eight. (1386)

1315. When I was an undergraduate at a small private university in 1970 a fellow student was working as a lab assistant. The weather was warm and she was wearing shorts and tennis shoes with no socks. As she carried two five-pint bottles of concentrated nitric acid up a flight of concrete steps she tripped and fell. Both bottles of acid broke and she landed in a pool of acid slipping back down the stairs. She went to the lab on the same floor to use the safety shower but the door was locked. She then ran up the stairs through the puddle and finally located an unlocked lab with a safety shower. By now two male students had arrived and were assisting her. She spent about ten minutes in the shower but her modesty prevented her from removing her acid soaked under clothes until arriving at the hospital. She suffered third degree burns on her thighs, buttocks and feet. She spent six weeks in the hospital with skin grafts.

Safety showers need to always be accessible; installed in some hallways. All clothing should be removed in the shower. Never carry two bottles of caustic liquid at one time. (1419)

1316. A young female student was carrying five-ml concentrated nitric acid in a graduated cylinder to her lab table. She was talking to someone as she walked. The base of the cylinder hit the lab table tipping the cylinder. The acid spilled onto the back of her hand. She walked to the front of the room to ask what to do even though all students were instructed as to what to do in case of spills. As a result she had third degree burns on the back of her hand and needed skin grafts to repair the damage. (1426)

1317. A seventh grade girl picked up a dropper bottle of nitric acid by the dropper. The bottle fell to the floor and the dropper remained in her hand. When the bottle broke some acid splashed on her leg. I sent her to the nurse. At this time neither the girl nor I knew that the acid was on her leg. When her leg started to itch that evening she went to the hospital. (1476)

Other cases include: 1153, 1154, 1349, 1437

Overcrowding in Schools

1318. Due to space restriction at our school, the elementary grades 7&8 share the laboratory space with the art room. Several minor incidents of fire have happened in the past few years because combustible materials are readily available to ignite whenever burners are used for experiments. Young people have a difficult time resisting temptation to burn the paper scraps which surround them. This is a serious fire hazard. The art teacher does his best to leave the room tidy but there are always treasures left behind in the sinks, drawers and cupboards. (1243)

1319. Our chemistry lab is designed for twenty-four students. The local administration sees no problem of placing thirty to thirty three students in a lab class. I have managed to hold the classes to twenty-four by promising to shut the lab down before permitting thirty students in at once. This is a ridiculous battle and I am tired of fighting it. (1430)

Other cases include: 1314

Oxygen Production

1320. During my third year of teaching chemistry at Cathedral High School in 1972, using a standard published lab experiment I had a rather explosive experience. The experiment involved the production of oxygen, using potassium chlorate and manganese dioxide. I had repeatedly warned the students about the need for clean glassware, but two students began heating their mixture in a dirty test tube. The test tube exploded showering them and at least four others with glass. Fortunately all were wearing aprons, goggles, and long sleeved shirts. No one got hurt and I had an experience to share with all my classes from that time on. (1001)

1321. My first year of teaching I had an accident which taught me a lot about lab safety. My chemistry class was making oxygen gas using potassium chlorate and manganese dioxide. Another part of the lab involved using magnesium to show burning in oxygen gas. A group of students put magnesium instead of manganese dioxide with potassium chlorate. Glass everywhere, bright white light. Student's explanation, "I didn't know it mattered, they look almost the same." Never overestimate your students. (1016)

1322. One of my high school chemistry classes was doing the old preparation of oxygen gas by decomposing potassium chlorate with manganese dioxide in a test tube and then collecting the oxygen gas by displacement of water experiment. A student allowed the test tube to tilt forward so the molten mixture blocked the one-hole stopper. When the pressure inside the tube built up the stopper shot out with some of the molten mixture attached. No injuries. (1041)

1323. During the mid-seventies, a certified but not knowledgeable Jr. High Science Teacher was demonstrating the production of oxygen and the use of the manganese dioxide catalyst from potassium chlorate.

Either through ignorance or carelessness powdered charcoal was substituted for the manganese dioxide. One can probably imagine the force of the exploding test tube when the mixture was heated. This action resulted in the embedding of glass in the facial area of several students. (1048)

1324. About eight years ago in a community college in eastern Massachusetts a potentially dangerous situation occurred in the chemistry lab. Students were following direction to generate oxygen from potassium chlorate and manganese dioxide.

Fortunately the instructor has always been a zealot for safety practices in the lab. Each lab period he makes them stand at attention, don goggles and put on aprons. He also has them prepare data books for the experiment to be done, carefully outlining procedures to be carried out in the course of the exercise.

In the course of carrying out the experiment one student's test tube exploded and the pieces hit him squarely in the goggles. Other pieces hit him in the chest. Minor cuts

occurred on the face and on his side. He was treated at the emergency room for minor abrasions. (1166)

1325. About twenty years ago, prior to eye glasses, etc. in the lab I gave a new science teacher a mixture of potassium chlorate and manganese dioxide so that she could demonstrate the preparation of oxygen. She also requested red phosphorus and sulfur to show how they reacted with oxygen. I told the teacher to keep it locked in her storeroom until she was ready to use it.

When she heated the mixture it exploded. The glass test tube vaporized and the force of the explosion hit her in the face. I feel her contact lenses saved her eyes.

Between the time I gave her the materials and the time she used them she left them on a table top and a student added some phosphorus to the mixture to see what would happen.

Fortunately no visible scars occurred and a lesson was certainly learned. (1225)

Para-Dichlorobenzene

1326. The experiment was to heat para-dichlorobenzene to show physical change. The student did not remove the stopper from it. He heated it strongly when the directions said to heat gently. He pointed it at the desk behind not at the wall. There was a blast of flame twenty feet long to the corner of the room. The student was saved because he was going to the front of the room to get something. (1236)

Pentane

1327. An undergraduate student was seriously burned in a fire in an organic chemistry teaching laboratory. The student was pouring pentane from a beaker into a flask at the time. The pentane vapors were ignited by a nearby heat source. The student, in an attempt to set down the beaker, accidentally poured the pentane on her blouse which caught fire.

The Teaching Assistant panicked and ran screaming from the lab. A post-doc in an adjoining room, along with a student assistant ran in and found the girl on the floor in flames. The entire bench top was on fire. The remaining students were terrified and hysterical. The student assistant extinguished the burning girl while the post-doc, using a fire extinguisher, put out the bench fire.

This accident involved three severe errors and violations of safety laws: first, the use of a flammable substance near a heat source; second, the desertion of the TA whose irresponsibility contributed to the extent of the injury; third the students' lack of safety training in important issues such as how to use a fire extinguisher. (1437)

Phenol

1328. In a biochemistry lab, a woman took dilute phenol from the freezer and put it in a warm water bath to warm the solution. After a few minutes in the bath the woman with the phenol bottle proceeded across the lab. The bottle bottom broke spilling the chemical on her lower abdomen and upper thighs. She quickly took off her skirt while standing under the safety shower.

She went to the emergency room to seek treatment only to find that the medical staff did not have knowledge of medical procedure for phenol burns. After calling the poison center for information they found that using ethylene glycol would prevent further spreading of the burn. She did end up with second degree burns. (1171)

1329. Chemical poisoning in our laboratories is not a major problem but the potential exists. On March 28, 1988 during a regularly scheduled second year organic lab, a student spilled approximately 10 ml of a phenol solution over her right hand. The class had received individual pre-weighed 8-gram samples to which 2 ml of water was added to obtain a solution for nitration. Her hand was immediately flushed with cold water for a period of fifteen minutes. The area Industrial First Aid attendant was notified. Upon examination of the injury a further fifteen minute flushing was done. Due to the toxicity and caustic properties of phenol this was advisable.

Disposable gloves were available but their use was not mandatory as would have been the case had students been weighing the initial samples. Successive labs used gloves without further incidence.

An error in judgment and lack of foresight on the part of the instructors was the primary factor in this accident. I am happy to report that the student suffered no ill effects and the burn was kept to first degree. (1237)

Other cases include: 1145

Phosphorus

1330. Around 1981, in a first year chemistry class of mostly junior students of above average ability, we were doing a lab generating and studying properties of oxygen. This lab was done in connection with studies about gas laws and properties of gas. Oxygen was collected through the decomposition of potassium chlorate. The students had completed the collection of gas and were doing an activity studying the properties of oxygen. Various chemicals were lowered into the gas bottle of oxygen via deflagration spoon. While using red phosphorous, the student tilted the spoon while removing it. Excess unreacted phosphorus spilled on the lab table and burned. The student attempted to put out the flame by patting it with his hand. He received third degree burns. (1101)

1331. As a high school student my instructor gave my lab partner and me a special project. We were asked to identify an unknown substance by performing various tests. A melting point might give some valuable information so we decided to melt this waxy yellow substance. It suddenly flared up and exploded - as yellow phosphorus usually does. Fortunately no injuries resulted. (1169)

Other cases include: 1108, 1270, 1325

Pipet Bulb

1332. The most serious accident I have witnessed occurred in my fourth year of college teaching. I have been teaching eighteen years at the college level, mostly analytical chemistry and instrumental methods of analysis.

In a sophomore level analytical chemistry lab a student was inserting a glass volumetric pipette into the constricted opening of a rubber pipette bulb. She was holding the pipette around the bottom of its enlarged portion. At the same time she was carrying on a conversation with her colleagues. The pipette splintered in her right hand. A large glass shard punctured her hand. A very large gash resulted. As the bleeding became intense she went into shock but did not loose consciousness. The gash was rinsed with cold water and covered with a clean white gauze. She was taken to the hospital where she received 40 stitches. (1311)

Other cases include: 1232

Potassium

1333. As part of a history report a student wanted to do a demonstration involving potassium metal and water. When the student added the potassium to water the resulting explosion spread the potassium over the carpeting in the history classroom. The fires started in the rug were extinguished.

The teacher did not properly instruct the student nor provide for safety procedures. The teacher did not check the room's facilities. Luckily no one was injured. (1290)

1334. A potentially dangerous demonstration is using Na or K with water. The reaction is very unpredictable depending mostly on the size of the piece you take and the surface of water in contact with it. To get a "better reaction" I will use a slightly larger piece. Sometimes sparks will jump out. I had one occasion where a student's book was burned. (1310)

Other cases include: 1427

Potassium Chlorate

1335. A ninth grade boy doing an IPS experiment using potassium chlorate had the contents of the evaporating dish explode. The student did what the teacher told the class not to do. As a result there was severe damage to the boy's finger, a deep burn.

The doctor was afraid of nerve damage. The lab ceiling was also damaged. This is what happens when students do not follow directions. (1281)

Other cases include: 1223, 1284, 1324, 1330

Pressure

1336. In a college lab a student watching crystal formation was deluged with glass and ammonia when the Erlenmeyer flask exploded. Gas pressure built up in the flask because of the reaction. (1073)

Other cases include: 1034, 1051, 1109, 1125, 1310, 1322, 1337, 1338, 1397, 1404, 1448, 1484, 1500

Pressure Cooker

1337. During my first year of high school teaching I was teaching a general science class when suddenly a terrific exploding sound occurred. It sounded as if a gun were fired. A pressure cooker had exploded sending large metal fragments and caustic solution all around the room next door. Students were making paper and were heating a mixture containing sodium hydroxide in the pressure cooker. The sodium hydroxide reacted with the aluminum resulting in the increased pressure. The safety valve did not function, and it blew up. No serious injuries. (1168)

1338. In a small school in central Massachusetts a senior student was working on his independent science fair project after school. His general area of interest was growing bacteria and he was sterilizing some agar medium in 500 ml Erlenmeyer flasks plugged with cotton. The sterilizing instrument was a pressure cooker being heated on a hot plate. The student erroneously left the room leaving the pressure cooker on and forgot it. When the water boiled away the safety plug blew out sounding like a shotgun blast. The plug wedged in the ceiling and the room was filled with cotton fibers floating in the air. If anyone had been in the vicinity of the cooker there is no doubt serious injury, if not death, would have occurred. (1190)

Propane

1339. A group of ninth graders were using propane torches because we did not have Bunsen burners. One boy turned the torch as high as it would go and began turning around. The room was very small so I said in my most commanding voice "Stop moving." A potential disaster was prevented. (1442)

1340. While using propane cans with adaptor tops as "make do" Bunsen burners, one student knocked one over. A six-foot long yellow flame shot out along the bench. There was a moment of panic as those close by realized what was happening. The panic quickly ended when a student just reached over and righted the can.

I use this to teach the idea that the most important safety equipment is your head and good common sense. (1478)

Other cases include: 1191

Protective Equipment - Improper

1341. During my first year teaching I had an eighth grade top level student splash herself in the eyes with chemicals being heated. The student was wearing her personal glasses rather than safety goggles. She was heating the material in a stoppered test tube contrary to specific cautions of the lab manual. In her great panic she rubbed her eyes with a wet paper towel and that aggravated the problem. Unable to see temporarily, she was sent to a local hospital and had her eye flushed. She returned to school two days later with no permanent damage. (1027)

Protective Equipment - Lack of

1342. Twenty years ago a student was using concentrated sulfuric acid in a ninth grade physical science class. He was seated and not using protective clothing. The acid spilled on his leg. He was taken to the hospital after much water had been applied to dilute the chemical. No law suits. (1029)

1343. A teacher was demonstrating the reaction of sodium and water. He wanted more dramatics so he used a larger sample than normal. The resulting explosion covered the twelve-foot high ceiling with residue. The first row of tables and students were also showered with debris.

The teacher had no chemistry background. He never measured quantities. No eye protection was used. No shield set up was used. He did not move the students away from the demonstration table and did not record the demonstration in his plan book so the supervisor could be forewarned. (1044)

1344. One of our biology instructors was stuffing a small bird. He was using a needle to inject formaldehyde and was not wearing goggles. He struck something hard and the solution popped out into his eye. This was many years ago when only the chemistry labs had portable plastic eyewashes. He came running and yelling into my class. We got him cleaned up and he had no problem with his eye. (1178)

1345. In a senior high school in rural Pennsylvania a student lab assistant was preparing dilute sulfuric acid for a chemistry lab. With the teacher present the student

assistant carried the concentrated sulfuric from the prep room to the fume hood. In transit the bottle struck the edge of a lab table shattering and spilling the contents. The student jumped out of the way with minimal damage and splashing. Water via a hose, no shower present at the time, was used to flush for fifteen minutes. No suit resulted but there was damage to the floor and ceiling. Today we have an acid shower and use rubber acid carriers. (1179)

1346. About six years ago three students were mixing aluminum and iodine. The lab was on the study of elements, mixtures and compounds. The students placed the two elements in a wet test tube and noticed a reaction starting to happen. They had cooked the test tube. Holding the test tube between them, they watched the reaction. The chemicals exploded, spraying hot aluminum and iodine into their faces. No goggles were worn. I had problems getting the three students to the eyewash because they all needed immediate attention. The amount of damage done, besides the speckled tan look, was one student had blurred vision for one day. (1203)

1347. It was my first year teaching chemistry at a new school. Lab aprons were not ordered. I attempted to order some but was informed there was no more money for this year.

We were doing a lab with 6M sodium hydroxide and a student was sitting down when he spilled it right on his lap. This student leaped in the air and in a very bow-legged fashion was rushed to the school nurse.

The next day I received a form from the nurse asking how this could have been prevented. I replied, "lab aprons." The next day my superintendent sent me a letter to order lab aprons on a rush basis. Money was no longer a problem. (1210)

1348. A student brought in a goose egg for the class to open and observe the embryo. Two students volunteered to do the demonstration. When the egg was punctured it exploded with a vile substance spewing into the face of the young man involved in the demonstration. The eyewash was inoperable so we splashed water on him and escorted him to the nurse. The gas that had been released with the rotten substance was also quite noxious so we opened all the windows to alleviate the odor.

Goggles should have been worn and the eyewash should have been working properly. (1212)

1349. One of our chemistry teachers had a heart attack in the middle of the year. He was unable to return and subsequently retired. At the time I was teaching seventh grade science. As a physics major turned middle school science teacher I was the only person who could be found on short notice to teach chemistry. I took over a level one chemistry assignment mid year.

No lab curriculum was in place that I could easily pick up and go with so I used what other teachers were doing. At one point I found a "neat" lab and decided to innovate. The lab required dilution of nitric acid and making up a 1M solution of potassium dichromate. The students were to prepare the dilutions.

In the lab was a special needs student. Since the students worked in groups of one or two the special needs student got the chemicals and another student mixed

them. Concentrated nitric acid was poured over potassium dichromate. The students did not have on goggles. The student mixing the chemicals must have sensed trouble as he turned away as the beaker exploded. Purple stuff was all over the place. A great stain was on the ceiling. The student was rushed the shower, washed thoroughly and taken to the nurse. An eye exam showed no eye or face injury. (1222)

1350. About six years ago my advanced chemistry class was in the process of preparing esters. One of the young ladies in the class who was not wearing glasses and had been wearing a protective apron had the following incident happen.

The liquid had been heated and all preliminary precautions taken but one; the direction that she waft the aroma produced. As she was wafting, the liquid bumped suddenly resulting in the fluid hitting her in the face, especially around the nose area. I immediately took her to the water fountain which was directly outside the lab room. Although she was very frightened she did not get any severe injury. We now require protective shields in all experiments. (1223)

1351. In an advanced high school biology class in 1987 in Massachusetts, the teacher asked a student to remove a preserved lamprey from jar and rinse it in sink. Tongs were provided but not safety goggles. Specimens were tossed into sink with a flourish. Another student got a bit of the solution in his eye and under his contact lens. We flushed the eye with tap water; the nurse drove him to the hospital. All was well. More goggles were furnished. (1257)

1352. A student in a high school lab wearing shorts splashed 0.1 M acid on her legs from a large carboy that we were using to distribute the solutions for a titration. (1276)

1353. A teacher was diluting hydrochloric acid. In the absence of a fume hood, the teacher was preparing the dilute solution in an open room. A sudden draft blew the hydrochloric acid gas toward the teacher's face. The resulting gasping for air resulted in more inhalation of hydrochloric acid. The result was severe irritation of the bronchi. The disturbing part of this accident was the general attitude that the expense of a fume hood was not warranted since these accidents don't happen that often. (1288)

1354. An eighth grade student was doing a demonstration of her science fair project. It involved using matches. As she lit the match it caught her sweater on fire. The judge with her was able to get the flames out. Other than a big scare the student was not hurt.

She should have been wearing a lab apron and goggles. (1364)

1355. It has been twenty-five years but the memory is still vivid. In a chemistry lab, a beaker of concentrated acid tipped forward over a classmate. Her apron was not around her neck; her dress was longer than her apron. I remember the appearance of her dress. It was eaten to shreds and her nylons disappeared. The teacher had to stand her in a small sink and splash water from the faucet. A shower would have been much more efficient. The teacher was lax in the wearing of the apron. I don't recall if any of us knew what to do. We all panicked. (1388)

1356. In Ohio around 1961-62, a student in a freshman general science class set a bottle of ammonium hydroxide down on the lab table after he opened it. He set it down harder than he anticipated and a drop or two splashed into his eye. There were no goggles available in that school for any classes and the only water in the room was one deep sink with a goose neck type faucet. The teacher immediately took the student to that faucet and held his head down over the sink running water over his eye. While this was being done a student was sent to the office to have the office call an ophthalmologist. No damage was detected upon examination.

The biggest problem was that no goggles were provided for the class. (1435)

1357. During the summer of 1985, I had been called to school to move chemicals so they could begin work on the new laboratory. I was working by myself and was in a hurry to finish. In my haste I was carrying two bottles at a time by the thumb rings. When I turned from the shelf to walk out of the storeroom, the bottles hit together. It knocked a small hole in the bottom and spilled down my leg.

We had no safety shower at that time so I stood still and ran through possible courses of action. I decided I must get help to wash off so I slowly crept toward the door and called for help.

Fortunately the custodians were working down the hall. They helped me to the custodian closet where I was able to slowly step on a chair using the unaffected leg and down into the sink. I washed the remaining clothing, most had dissolved by this time, and my leg with plenty of water. The fire department's chemical spill unit came to clean up the storage area.

Serious injury was avoided only because my pants leg absorbed most of the acid and kept it from my leg. I tried to keep calm and not run down the hall. And I was lucky. (1436)

1358. In a second semester college chemistry lab a student was not wearing goggles while heating a basic solution. She was very near sighted and had her face almost on top of the solution. Somehow the solution splashed and got into her eyes. Her eyes were flushed with water and she was rushed to an emergency room. There was no permanent damage. (1447)

1359. In 1980 in a chemistry lab some hydrochloric acid was splattered into the eyes of a student who was not wearing goggles. We flushed his eyes with plenty of water. (1477)

Protective Equipment - Lack of Maintenance

1360. In a general chemistry lab about five years ago I noticed a student rubbing his eye at the end of a lab. We had been using 1M hydrochloric acid and I had instructed the students in how to handle and pour acids. I told them to wipe the bottle with a wet paper towel and rinse their hands afterward. However in questioning this student I found out he had not washed his hands and after the lab he rubbed his eye casually. This must have deposited some acid in his eye.

When I spotted him his eye was quite red and itchy. As our eyewash bath squirts out rusty water we rinsed his eye as best we could and I sent him to the nurse. He went to the hospital where they flushed his eye. Luckily he only suffered minor burns.

I tell my students this story every time they are handling acids or other possibly irritating chemicals. (1224)

1361. Chemistry students were doing a lab experiment using dilute hydrochloric acid. A student spilled some acid on the arm of another student. The safety shower was near so the teacher told the student to wash the arm in the shower. The shower valves had corroded and it did not work. The teacher used water from the lavatory sink to dilute it. It was fortunate the acid was dilute. Another good thing was that it was winter and the student had a long sleeved shirt which was quickly and easily removed. (1283)

Radioactive

1362. In graduate school I was doing a tissue culture experiment using tritiated thymidine, HeLa cells and pipettes. While mouth pipeting from a canister with supposedly only 10-ml pipettes one 1.0- ml pipette was packed in with the others and when drawing up the fluid with the small pipette the "safety" stopper of cotton, fetal calf serum, HeLa cells, and thymidine went to my mouth.

I immediately spit out the materials, wiped my tongue and rinsed my mouth. I then scrubbed my tongue and had a radioactive assay of my tongue. It proved negative. I had no instruction regarding the technique. (1074)

1363. During the time period between 1964 and 1988 over sixty people received unnecessary exposure to twenty millicuries of radium. It was stored unmarked and not inventoried in a university chemistry lab. (1404)

Other cases include: 1301

Razor Blade

1364. A left-handed honors student, who thought he knew more than the teachers, always cut with a single edged razor blade towards him. He had been told repeatedly not to do so. One day, after telling him again not to do so, he sliced his finger and bled profusely. I had demonstrated the right procedure to the whole class. I had given three quizzes on lab safety and procedures.

Even so, I was written up by the principal and it was put in my file. (1320)

Refluxing

1365. An experience which illustrated the value of protective eyewear occurred during an organic chemistry lab. I am not sure what the actual chemicals were but the procedure did involve refluxing for a long period. The apparatus of the student across from me broke showering both of us with hot chemicals. An apron protected my clothing to a degree and I was not too concerned until I removed my eye protection and found them spotted with chemical. The value of something I had looked upon as an annoyance was very much impressed on me. (1233)

Ring Stand

1366. In the early 80's, while cleaning up at the end of a lab, a student hurriedly put away a hot ring from a ring stand in a designated drawer using tongs. When the next class came in a student assigned to the same drawer grabbed the hot ring and burned his hand. Fortunately the damage was not extensive.

After the incident, it became a lab safety policy that all hot metals be rinsed off with tap water prior to being put away.

It would be ideal for students to not share equipment but this is not always possible. (1105)

1367. A student turned over a beaker of hot water that was used for a water bath. The hot water was spilled down the clothes and raised blisters on the stomach. The students, who were fifteen-years-old, went to remove the beaker from a ring stand on which it had heated. They used beaker tongs but caught the edge of the beaker and it slipped. The students were rushed to the bathroom (we did not have safety showers) stripped and cool water applied. No aprons at our lab were provided by the school or county. (1119)

Other cases include: 1040, 1047, 1100, 1230, 1254, 1310, 1395

Rocket

1368. During a science project demonstration a model rocket did not go up straight because only one engine went off. This wasn't too bad except the class was observing from underneath an overhang because it was raining. The rocket went over everyone's head into the school and was going in circles around the hallways. (1411)

Other cases include: 1166, 1437

Rubber Stoppers and Insertion of Glass, Thermometers, or Thistle Tubes

1369. A student was putting a thermometer through a rubber stopper. The thermometer met with resistance in spite of the water applied. The thermometer slipped, snapped in half and cut the palm of the student's hand. The nurse was contacted. Fortunately the cut was not too severe. (1004)

1370. In 1987 the third-grade gifted class from a local elementary school visited the science classes at my high school. One biology class dissected a sheep brain. The children were very excited about this. Another biology class showed them a variety of animals. My AP chemistry class planned to show the student a variety of demonstrations. Each pair of high school students planned, prepared the equipment and discussion to follow. As the elementary students were entering the room one AP student was completing his set up. He was inserting glass tubing through a rubber stopper. He was using wet paper towels. He held the tubing too far back, it slipped and the jagged end went through his hand into the part between two of his fingers. Blood shot out into the class room and into the hall. The AP student was in a "semi-shocked" condition. I attempted to stop the flow of blood using pressure. He was taken to the doctor and received stitches on both sides of his hand.

In retrospect I believe monitoring high school students is as much responsibility as one teacher should take on. I am not in favor of having "little" visitors any more. (1130)

1371. In a freshman college chemistry lab in 1979 the class was fire polishing ends and inserting glass tubing into stoppers for later use. After a demonstration and 15 - 20 minutes of directions and cautions the students got started.

I was helping one set of students when another student from across the room walked up to me with a piece of tubing through his hand. (1132)

1372. Ninth grade physical science students have cut themselves after improperly inserting thermometers into stoppers. Students simply just don't listen carefully enough. (1136)

1373. In 1968 when I was an eleventh grade high school chemistry student a friend of mine was putting thistle tubing into a stopper. It broke and it went into her hand. She has recovered full use of her hand. (1137)

1374. In an eleventh grade chemistry class a student neglected to put on protective gloves. He attempted to insert glass tubing in a rubber stopper. The glass broke and the shattered end drove into his hand. He was sent to the nurse and then to the doctor for several stitches. No legal action taken. (1174)

1375. In a chemistry lab in high school in the early 1980's a young man was attempting to put a thermometer through a rubber stopper. He had lubricated with glycerin but since there were no towels available was not protecting his hands. There had been no problem with soft rubber stoppers. This boy's stopper was abnormally rigid, he pushed too hard, the thermometer broke, and cut into the palm of his hand. The cut required stitches.

Since then I have insisted the students wear gloves. I will not permit them to do that procedure without protection. (1185)

1376. In 1986, my second year of high school teaching, the starting wide receiver on the football team twice in one period stabbed himself in the same hand with two different thermometers that broke when trying to insert through a rubber stopper. The student was using a hydrocarbon lubricant and a towel to wrap around the stopper. He still "got" himself. Needless to say the coaches were rather upset. The cork borer/bullet system does seem to be a good method to avoid this situation. (1217)

1377. A student broke an alcohol thermometer while inserting it in a rubber stopper. The student had been shown an acceptable way this could safely be accomplished. Rubber shields and glycerol were both available.

The student used the glycerol but did not use a shield and was pushing the thermometer in from the end. It broke and she suffered rather deep cuts to one hand which required 2 or 3 stitches to close.

I expect this could have been prevented by inserting all the thermometers for all the students myself prior to the lab. I suspect that this is unnecessary with a senior class. (1238)

1378. A ninth grade student tried to move a glass bend to a different position in a two-hole rubber stopper, although the class was repeatedly warned not to move the glass bend themselves but to ask the teacher for assistance. The glass piece broke and the student was cut on the hand. The teacher applied direct pressure to stop bleeding and called the school nurse. (1278)

1379. Students were instructed to use glycerol to insert glass rods into rubber tubing. One student did not follow instructions and tried to force the tube. The glass went into the palm of his hand with great force. As a result he suffered a severe cut to the hand. He also kept repeating he wished he had listened. (1284)

1380. In a college chemistry class in 1964 a student, attempting to insert a piece of glass tubing through a rubber stopper, placed the stopper in the palm of his hand. His hand slipped, the glass broke and the broken end went entirely through the palm of his hand. (1329)

1381. A student received a cut on the palm of the hand when he tried to force a glass bend through a stopper. The student used no lubrication. He did not follow directions about how to do this safely. (1335)

1382. In a 1982 chemistry class I gave a demonstration to the class on the techniques of working with glass tubing. I impressed upon the class that the sharp edges of the glass be polished, and to use glycerin as a lubricant when inserting the glass tube through a rubber stopper.

The student never polished the glass tube and as a result he shoved the tube through his hand. (1338)

1383. A student broke a thermometer in his hand by forcing it into a two-hole rubber stopper. He started doing this before the instructions on how to proceed were given. He sliced the tip of his finger. It healed with the first aid given. (1365)

1384. During my first year teaching one of my students received four stitches in her hand when the glass tubing she was trying to put in a stopper snapped and cut her. I had mentioned in other classes to use glycerol as a lubricant but somehow I had forgotten to mention it to this class. When you teach three or more classes of the same subject sometimes you forget what you told each class. Now I write down more in my lesson plan book noting where I am in each class. (1372)

1385. In a junior high science class students were collecting oxygen gas by water displacement. They had to put glass tubing through a hard rubber stopper. One student was forcing the glass without proper wetting. The glass broke in his hand and pierced his hand. (1373)

1386. A student trying to push glass tubing through a one-hole stopper broke the tubing. Sharp glass went into his hand. (1389)

1387. A glass thistle tube being put into a rubber stopper broke and the tube passed through the student's hand. This happened in a college chemistry laboratory in 1965. (1399)

1388. A high school chemistry student tried to insert a right-angle glass tube into a rubber stopper. Even though a demonstration of the proper method was described and shown just fifteen minutes earlier a sixteen year old boy walked up to me to show that the tubing had broken off, went through the palm of his hand and out the back side of the hand. I left the glass in position and got him to the school nurse, then to a hospital.

This star basketball player missed two months of playing while the hand slowly healed. (1407)

1389. In a high school chemistry lab in 1960 a student was not listening to the instruction on how to insert a thistle tube into a rubber stopper. When the student presented himself to the teacher with the broken tube through his hand the teacher was very nonchalant about the injury. The teacher did little until the student was very worried then first aid was administered. (1415)

1390. When I was a high school student another student was inserting a thermometer in a rubber stopper. The thermometer broke and punctured her palm. She had to be rushed to the emergency room for stitches. The accident could have been prevented if the student had used a lubricant and had been holding the thermometer and stopper with rags. (1438)

1391. My first year of teaching chemistry was in a small high school in Kentucky in 1960-61. We were using a set up with long-stemmed funnel. I had instructed and demonstrated how to put them through rubber stoppers. One young man, 17-years old,

ignored the instructions and tried to hold the tube by the funnel and shove it through. The tube broke and went all the way through his hand. We sent him to the doctor to have the glass removed. Thank goodness it was the thin fleshy part of his hand. He only needed a few stitches and was able to come back to school the next day. (1441)

1392. A student put a thistle tube through a rubber stopper without sufficient lubricant. The tube broke and went into his hand. The result - the student was fine but I no longer use glass thistle tubes nor do I let the students put glass rods or thermometers through rubber stoppers. (1463)

1393. Inserting glass tubing, a student drove tubing through the webbing of his hand between his thumb and his pointer finger. (1466)

1394. A student, impervious to teacher directions, tried to force a non-lubricated glass tube into a rubber stopper. The tube broke cutting his hand. Stitches were required. (1483)

Safety Shower

1395. An eleventh grade chemistry student was heating a beaker of solution containing a weak acid. Heating was done on a ring stand over a Bunsen burner. The student left the stirring rod in the beaker and accidentally hit the rod knocking over the beaker. Contents spilled over the table, floor and students legs.

The teacher immediately washed the student using the safety shower. (1096)

Other cases include: 1314, 1315, 1328, 1357, 1361, 1367, 1413, 1455, 1464

Security

1396. In a high school general chemistry class in 1988 two laboratory carts were set up in the back of the room for labs for two other classes. The passing bell rang, one student picked up a dropper which was in a very dilute hydrochloric acid and squirted it into two other students' eyes.

Prevention: have a separate prep room where you can lock up chemicals when not in use. (1162)

1397. A patient examination room in the admissions building of a Psychiatric hospital was left unlocked. The building was new and the lock did not function properly. The examination room was really intended to be an office and had wall-to-wall carpeting. Someone entered the room and tampered with a wall-mounted sphygmomanometer that was used with a blood pressure cuff. The mercury in the sphygmomanometer sprayed all over the carpet. About 20-30 ml of mercury was sprayed. A professional removal company had to remove the contaminated carpet. (1180)

1398. At a high school in Knoxville, Tennessee two students stole a one-pound container of sodium metal from an unlocked storeroom. They went to a bathroom and emptied the contents into a toilet. When they flushed it several were blown off the wall. The students claimed ignorance as to what the consequences of their action might have been. (1184)

1399. Our school is "open-concept" in structure and as such there are no doors in the science area. The problem is the various lab equipment and chemicals are all well within easy reach of anyone who desires to take them. (1429)

1400. A visiting youth group with supervisors, renting the school one week end, opened the chemistry lab without permission with the common master key. They removed five pound stock bottles of potassium nitrate and sulfur and a two-pound bottle of charcoal. These were all reagents used in freshman physical science and in chemistry.

The chemistry teacher immediately reported the "robbery" on Monday morning and the huge danger potential of the substances when mixed. The youth directors paid $35 for replacing the chemicals, there were no reports of explosions. The administration changed the keys to the two science rooms so that now only the science teachers and administrators have access to those rooms. There have been no further problems with vandalism or robbery. (1459)

1401. October, 1988 a student managed to remove reagent bottles of aluminum chloride and ammonium nitrate from the chemistry supply lab. He carefully mixed the two in a 2000-ml round-bottomed flask in the stairwell. Heavy amounts of smoke were released along with large amounts of ammonium chloride. Several teachers and students inhaled large volumes of the irritating gas. The school was evacuated and the fire department summoned. (1464)

Separatory Funnel

1402. In college in 1957 I was neutralizing butyric acid with sodium bicarbonate in a separatory funnel. I placed the stopper on the funnel and shook it rapidly four or five times. I wound up wearing butyric acid for several days on my skin. It came right out of my clothes. (1201)

1403. A student in an elementary organic lab was using a separatory funnel to wash a reaction product. This particular wash was being done with concentrated sulfuric acid. The teaching assistant took the funnel to help the student. The funnel broke and the acid was sprayed all over the TA. He was quickly and thoroughly washed, bicarbonate was applied and after his outer clothing had been removed he was taken to the Health Service. There similar treatment was continued and he suffered no damage.

The cause of this accident is uncertain. The experiment was a standard one. It had been done many times and this was the first and only time that such an accident occurred.

The only cure that I am able to devise is to cut the scale of all experiments in an organic lab. The adoption of semi-micro techniques would save money for both the chemicals and disposal. It would cut the risks of such an accident occurring again. (1298)

1404. An organic student improperly used concentrated sulfuric acid to dry a liquid in a separatory funnel. By shaking the funnel violently the contents became foamy and hot. The pressure build up caused the stopper to be blown out. The acidic, hot contents were sprayed all over a student across the bench. Luckily the damage was limited to a scar in the student's scalp.

The guilty student refused to follow lab instructions. All the other students recognized him as a danger but we could not exclude him from the lab. (1449)

Other cases include: 1161

Shut-Off Valves

1405. A teacher at our school had a gas jet break and burst into flame. The controls for shutting off the gas were outside the building and were rusted tight. Janitors had to be called with big wrenches to turn the valve. This happened before I came and yet nothing was different when I arrived. We still need a janitor to turn off the gas. (1020)

1406. One day a student came running into my chemistry class and told me I was needed in the biology lab because a water pipe had broken. When I arrived I noticed one of the faucets on A lab table had been broken off just below where the valve had been.

There was a stream of water shooting straight up and saturating a fluorescent light fixture. It also caused a large volume of water to flow off the lab table into two live electrical outlets. There was already approximately four inches of water on the floor.

The teacher in charge of the class was trying to shut off the water but he could not find the water shut off valve. I finally located it inside a sealed compartment on the lab table. The only way to gain access was to lay down in the water and to smash the side of the lab table with forceful kicks.

The major problem was the poor design of a laboratory table that requires someone to lay on the floor and then reach around water, gas and electrical lines. All the tables in our science department are the same. We are working on the administration to replace all the tables. (1434)

Skin Injuries

1407. In 1982 in a ninth grade accelerated biology class I had a trained lab aid cleaning test tubes from a microbiology class. He dropped one into the sink breaking it. Large pieces of it were in the depressed drain so he tried to remove them. Of course he cut himself. (1126)

1408. A student at the University of Georgia in organic chemistry was conducting an experiment using concentrated sulfuric acid and a reagent. The student combined the chemicals in a test tube and used her thumb to close the test tube. The burn was so intense she passed out. (1135)

1409. During a chemistry lab activity involving the use of concentrated sodium hydroxide a student spilled a quantity on the lab table. He didn't tell the teacher but wiped it up with a paper towel, leaving some on the counter. The next class came in and a student sat down on the counter. The chemical soaked into his pants and burned him. The teacher recognized the problem only when the student reported pain. He had to be treated at the hospital. He missed a day of school and could not sit down without pain for a week. (1142)

Other cases include: see index for Burns and Injuries

Smoking

1410. In January, 1985 in a Newark, New Jersey hospital, an AIDS patient had been cautioned not to smoke. He was on oxygen via nose tubes. He disobeyed and tried smoking causing a fire down the tube to his clothes and linen. Thank goodness a nurse happened in and shut off the oxygen bottle before the flames reach it. The patient died due to the fire and the disease. (1352)

Soap Making

1411. A senior girl using ethyl alcohol in soap making. It heated and caught on fire. It spilled on the girl's apron. No serious physical damage. (1053)

1412. During a soap-making lesson, while heating alcohol in a water bath, a student did not place the alcohol in the outside beaker. The alcohol boiled over and down onto the Bunsen burner. The student received a burn on the left hand.

The reason for this accident was not listening. The beaker for alcohol was unmarked. There was too much socializing at the lab area. There was a failure to dye the water and a lack of hot plates. (1076)

1413. In the spring of 1969, my first year as a teacher, I had my class make soap (saponification). This was a regents-level class that contained mostly very bright students. Some students were using fat and others were making their own fat from stearic acid and glycerol, using sulfuric acid as a catalyst (esterification). The fatty layer was then decanted off to remove the remaining sulfuric acid.

One rather bright student had mixed his fat with sodium hydroxide (concentrated) but nothing much was happening. Nothing speeds up a reaction like a catalyst and in utter disregard for the directions, and apparently in confusion between esterification and

saponification, he added concentrated sulfuric acid to the fat and base mixture. The resulting explosion sent the fat, base, soap, acid mixture all over his body except for his face. He was wearing goggles.

He went quickly to the science office/prep room where the department chairwoman and I stripped him and covered him with baking soda. He was ok since most of the splattering was absorbed by his clothes. He did have some chemical burns on his arms but those healed.

Our school learned the hard way but we now have five pounds of baking soda, eyewash stations and safety showers in the chemistry labs. We are getting a new high school in 1990 and hopefully every science room will have a shower and a permanent eyewash station.

I am not sure how this accident could have been prevented short of not allowing the students to make their own fat, hence removing the sulfuric acid from the room. Clear, concise directions were given in writing as well as verbally. I think it was just one of those cases where a student suffered from a temporary loss of "think power." (1315)

Sodium

1414. I was working as a graduate student distilling a needed solvent that had been prepared with sodium metal. I threw the residue down the sink and of course, the Na reacted accordingly. In my panic, I poured water onto the fire, only to aggravate the reaction. Fortunately the harm was only to my ego and I suffered embarrassment but no injuries. (1025)

1415. A first year teacher at a high school was demonstrating how violently sodium reacts with water. He used a 50-ml or 100-ml beaker about half full of water and dropped in a piece of sodium. The reaction shot violently up and out of the beaker, landed on his grade book, burned a hole through it. No one else was close at the time. (1032)

1416. A general science teacher was demonstrating the reaction of sodium with water. The teacher used a large chunk of sodium. The reaction became vigorous. There was a loud "Bang" and the beaker shattered. Fortunately no one was injured. (1040)

1417. Twenty-five years ago at a community college a chemistry professor left the prep room carrying glass jar with a block of sodium in kerosene. A leaky faucet at the demonstration table left a puddle near the deck at the front of the room. The professor slipped in the puddle, the jar fell showering the professor with kerosene, the sodium hit the water and the reaction ignited the front of the classroom. The professor died. The students escaped out the windows of the class. The room was totally destroyed. (1049)

1418. Sodium-water reaction demonstration. This reaction was demonstrated for a number of years to high school and junior high chemistry classes. It was done out doors with a plastic bucket, a cube of sodium about the size of a quarter and the students 20 feet away. This particular day a gust of wind came up just as the sodium

exploded. A small piece of sodium hydroxide landed in a student's eye. There was minor irritation after washing. (1078)

1419. In the spring of 1985 in a chemistry II class, students were doing demonstration for projects. One student was going to cut off a little sodium and drop it into water. He did not have on goggles. Some of the sodium popped out and into his eye. He and the teacher ran into my room to the eyewash. As the first water hit his eye it actually sparked visibly to me and most of my students. The boy went to the hospital and had to wear an eye patch for a few days. He was lucky and not permanent damage was done. (1115)

1420. This accident occurred during a twelfth grade chemistry class in 1962 when I was a student. A male student place a thumb-sized pellet of sodium metal in his back pocket to carry out of the chemistry lab. He received a severe burn and was unable to come to school for about ten days. The teacher was sued by the parents and had to pay all the medical bills. (1122)

1421. When working with the reactivity of group I & II A metals in a high school chemistry class in 1986 the element sodium was used. The first period there were no problems. The metal was place in a sink and water added to cause a reaction. However on standing out the sodium began to dry out and the next period the metal was explosive. A student was burned as a result of the fire and sodium hydroxide that was produced. Fortunately he was wearing safety goggles. (1128)

1422. A work-study student at a private college was hired to wash chemistry glassware. The student was not a chemistry student.

On the day of the accident he was not wearing goggles. As he began to wash, he filled each piece of glassware with water. One of the pieces contained some solid sodium. The container burst into flames and the young freshman student was blinded for life.

He should have been instructed in the proper safety procedures, goggles and aprons required at all times. (1147)

1423. In a ninth grade physical science lab around 1975 a first-year biology-major teacher was teaching laboratory safety. He was showing the class how certain hazardous chemicals were so reactive that they had to be stored under liquid. In demonstrating this, the teacher showed the container that the chemical was in (sodium?) so the students could see the liquid. He then took the chemical out of the liquid with forceps and held it up for all to see. It reacted with the water in the air and he dropped it to the floor. I was teaching next door when I noticed a wall of smoke coming under the door that joined our rooms. The smoke continued up the side of my classroom wall, across the ceiling and out the large windows that were opened at the top. (1160)

1424. In 1978 in a chemistry lab in Maine eleventh grade students known for errant behavior were doing a lab involving the use of sodium metal reacting with water. The

teacher distributed pea sized amounts to the students for their work. It was a lab of some twenty-four students. Several of the students decided to concentrate their sodium. They also decided to cover the dish where the reaction took place. They used a watch glass. This was done while the teacher was involved with helping other students.

A small explosion took place and sodium hydroxide was splattered around. Several students got some splashed in their faces. All went immediately to the eyewash to flush. (1170)

1425. A friend, roommate and classmate, in organic chemistry class in college was reacting sodium in alcohol. Before the sodium was completely consumed he emptied the test tube contents into the sink. The sodium on contact with water in the sink reacted more vigorously igniting the alcohol. The fire was contained; no real damage. (1196)

1426. In our chemistry laboratory a student placed sodium residues in a waste solutions bottle. A small explosion occurred causing a glass funnel to fly off the container and smash on the floor. This could have been avoided had the student followed instructions to give sodium residues to the teacher for disposal. Since then the glass funnel on our disposal container has been replaced by a plastic one. Students are still urged to give residues such as sodium to the teacher. (1245)

1427. A tip on how to survive Friday afternoon with Grade 9's without murdering one of the little brutes. You have to do party tricks.

One fine Friday I decided my "trick of the week" was going to be the reaction of sodium and potassium with water. I set up the lab. Two large bowls of water. A safety screen. The kids all in a row, two benches back. Me wearing goggles. All according to the book.

The sodium worked but the kids were bored. No flames, no flash. Well, I didn't want to disappoint the little darlings. So I tried the potassium trick again. This time with a piece that wasn't the regulation grain of rice size. This was more like the size of a small pea.

This worked. I got the best "purple waterfall" effect I have ever seen. Some of the sparks jumped over the safety screen towards the kids. Most of the kids got out of the way. One kid wasn't looking. He was the one that got hit on the side of the face. He was immediately put in the shower and flushed for a long time.

By the end of the afternoon the side of his face looked a bit flushed. He had little pin pricks where the potassium had hit him. By Monday morning the pin pricks had turned into craters. He is pock marked to this day.

My lucky break is that this was in England so the parents did not sue. Actually they didn't even complain. They couldn't speak English so I couldn't tell them I was sorry.

The moral of this is of course, don't do party tricks, don't bore kids, don't teach or possibly, don't infringe the safety rules on little bit. The moral I actually thought of at the time was none of the above. I decided from then on I would avoid potassium like the plague.

The next time a party trick was due, with another class, I simply told them I wasn't going to do potassium, because I had had an accident with it. I gave them all the gory details which is almost as good as a party trick as far as the kids are concerned.

I did the trick itself with sodium only. Unfortunately we were getting rather low on sodium. It was a very poor school. The chemistry budget was $1.00 per year per child. I felt I ought to economize and use up the last little bit of sodium in the bottle. I squished up all the little pieces, under oil, to get one rather big lump, about 1 cm 3 in size. I sliced just a tiny bit off that.

Safety set up all according to the book (just as before). Totally unworried, I dropped the sodium into the water. It exploded. I suppose hydrogen had got trapped in the tiny spaces between the squished up bits of sodium.

This time no one got hurt. Fortunately.

My "memento more" is simply a crater in the ceiling of the Junior Chemistry Lab.

The moral of the tale? Don't do any party trick, don't teach, don't economize, don't squish up sodium. (1252)

1428. In 1962 during my second year of teaching at a Junior High School in the Boston area, I was demonstrating the reaction of sodium with water to my class. The demonstration bench was at the side of the room so when the class turned to face the bench the students in the row closest to the bench were only a few feet away. A spark from the reaction ignited the hydrogen gas and the solution splattered and hit the face of one of the students. I flushed the student's face with a lot of water and saw that he received proper medical attention.

When I do this demonstration now I make sure that everyone is a safe distance away and that a wire gauze is placed over the reaction chamber. (1255)

1429. A teacher doing a demonstration of sodium in water in a large tank containing phenolphthalein. All would have been fine but the teacher inverted a large glass beaker over the reacting sodium which instantly exploded sending Na and glass shards in all directions. Fortunately the instructor was wearing a lab coat and ordinary glasses. No injury was sustained. (1274)

1430. A fellow student was injured during an experiment showing the volatility of Na when placed in water. The experiment was done in the open and a piece of the Na was thrown onto him and burned him severely. (1339)

1431. In 1986 in a physical science lab, sodium was added to water in an excessive amount. The beaker broke and smoke filled the room because improper ventilation was used. The sodium splattered onto the floor and also hit a student. It burnt small holes in his shirt. (1351)

1432. In college a student discarded unused sodium into the sink. There was an explosion and large flames shot up. The dangers of sodium reacting with water were not covered in the instructions. (1421)

1433. During a lab that contained thirty-plus students, a student managed to get some Na metal. He put the metal into a beaker of water on his lab bench. The resulting explosion sent pieces of hot sodium flying around the room. One piece hit a student on the forehead causing a severe burn.

The primary error was in not recognizing that in a large class it is impossible for the teacher to keep an eye on everyone. Secondly materials like Na must be watched especially closely. (1480)

Other cases include: 1063, 1104, 1180, 1343, 1398, 1447

Sodium Hydroxide

1434. A student in junior high, not wanting to take the time to find a glass stirring rod, stirred a sodium hydroxide solution with a pencil. He then laid the pencil on the table. When his lab partner returned to the table, the partner picked up the pencil to start answering questions. While thinking about the answer to a question the partner ran the eraser over his lips. He proceeded to wet them with sodium hydroxide. (1427)

Other cases include: 1337

Sodium Peroxide

1435. A student was weighing out some sodium peroxide on a sheet of wax paper. The student sneezed and the paper caught on fire because of the strong oxidizing agent. I immediately put out the fire. No one was hurt but I have not used sodium peroxide since. This accident occurred about 1980. The student was an eleventh grade girl. (1140)

1436. A college prep chemistry class was performing the lab in preparation and properties of acids. This took place around 11:30 A.M. in April of 1980. A generating flask exploded. Materials in the flask, sodium peroxide (a vigorous oxidizing agent) and water, plus glass from the flask were forced across the room.

Two girls, partners in the lab, were working with the apparatus at the time of the explosion. Both were affected by the force of the explosion. One complained of a hearing loss and both were cut by the flying glass. Both were sent to a near by hospital.

Another boy in the class also complained of a partial hearing loss in one ear.

Having run this lab over a period of ten years, several times per class, no reason for the explosion has been found. No extra caution is given in lab direction.

The girls had already collected two bottles of oxygen when the explosion occurred. (1151)

Spill Response

1437. As a working physicist in the 60's I was involved in the spill of several hundred gallons of red fuming nitric acid from a sounding rocket on a launch pad. We were prepared and were able to pressurize the block hose and wash down the tower. No one was hurt. (1055)

1438. In 1986 a teacher attempted to neutralize a hydrochloric acid spill with spill toner without reading the instructions. She put full strength neutralizer onto concentrated acid. There was a violent reaction causing respiratory and eye irritation. (1056)

1439. There were two honors chemistry classes being taught by two teachers. There was a lab aide who was instructed to get together a lab that used 6M hydrochloric acid. The acid was placed in a 2-L flask, stoppered and placed on a cart. The students used the 6M hydrochloric acid from a brown dropper bottle holding only 100 ml of the acid. The other teacher performed the lab without incident. I was the other teacher.

At the end of the lab exercise when the students were all finished I was placing some containers next to the 2-L flask of 6M hydrochloric acid. I accidentally touched the flask with another bottle and broke the flask containing the 2-L 6M hydrochloric solution. I dismissed the students. I went to our acid spill kit and put on sodium bicarbonate. I then got a janitor to help clean up the mess. (1058)

1440. One not so serious but impressive incident that occurred in my lab was a perfect example of the domino theory in action. A student bumped another. The student in turn knocked his apparatus over causing his neighbor to be splashed. That made him jump and knock into the person behind him. This continued down the room resulting in a series of spills and accidents none of which became serious but the potential was there. (1079)

1441. In 1955 at a tank repair facility in Germany we were forced to prepare a solution of sulfuric acid suitable for use in batteries (electrolyte) from concentrated acid purchased from local sources. We were unable to get a supply of regular electrolyte through our normal channels. The thick syrupy concentrate was supplied in approximately twenty-five gallon glass jugs. We had to mix it with water.

A truck backed into the mixing area knocking over two of the jugs smashing them and spilling the acid. A worker mixing the acid attempted to stop the truck but was unsuccessful. When he saw the unavoidable, he ran to a near by building.

No one was hurt. The area was washed with water, the solution went down the drain. New materials were purchased so the operations could continue. The area was blocked off to vehicles. (1167)

Other cases include: 1001, 1004, 1005, 1007, 1010, 1012, 1036, 1094, 1095, 1096, 1144, 1185, 1218, 1246, 1262, 1277, 1286, 1289, 1292, 1305, 1308, 1316, 1328, 1329, 1330, 1342, 1345, 1347, 1357, 1361, 1367, 1395, 1409, 1411, 1442, 1447, 1458, 1461, 1462, 1463, 1464, 1465, 1475

Stopcock

1442. A shipment of burettes and their matching Teflon stopcocks with pipette ends arrived, unbroken, in September 1987. After visual inspection the teachers put them away. A month later, the pipettes were taken out to be set up around the room to disperse solutions for ninth grade physical science classes.

In the process of assembling the stopcocks and burettes, the teachers found that the stopcocks didn't fit the first two burettes. They broke.
The remaining burettes were set up for use. The next day a student went to take dilute acid from a burette. Unexpectedly, the stopcock fell out, spilling acid on the students hand. (1090)

Other cases include: 1035

Storage

1443. About 1975 a high school chemistry stockroom was being inventoried. One shelf of chemicals became unbalanced. All the bottles on the shelf fell. Several broke. Fortunately no bad reactions occurred. (1111)

1444. In 1986 in a high school chemistry lab a large bottle of ammonium hydroxide had been moved from the stockroom to the classroom. The ammonium hydroxide was to be used in a lab exercise on acids, bases and salts. The bottle was sitting on the demonstration table. A student moved the bottle from the table to the floor directly in front of the demonstration table. Another student accidentally kicked the bottle over. The bottle broke and the lab had to be evacuated. (1141)

1445. A beaker of petroleum ether was placed in an ordinary refrigerator. During the night a spark that occurred when the refrigerator compressor turned on ignited the vapor. The refrigerator and some of the laboratory were damaged by the fire. Luckily the fire was spotted and extinguished before it caused a lot of damage. The error was not using the proper type of refrigerator. (1241)

1446. There was a fire in a lab stockroom. We do not know the cause. Several things contributed. Chemicals of mixed nature were stored haphazardly on wood shelves. Solid chemicals locked away with no hazard marking in a wooden cabinet. No files were kept to identify what was in the stockroom

Several weeks later and the state science consultant still does not know how it happened. (1291)

1447. A teacher finds an unsafe condition in the stockroom located between two adjoining classrooms. Sodium and other water-reactive chemicals are being stored beneath the drain pipe to a working sink. After reporting the condition to administration a safety cabinet is purchased.

The teacher is not given any release time to correct the condition. In an attempt to move the material between classes, a bottle of phosphorus trichloride is dripped on

the floor. The floor had sustained a water still overrun the previous day. The tiles were still damp under the linoleum.

The phosphorus trichoride reacted with the water producing a cloud of hydrochloric acid gas. Both classroom and stockroom has to be evacuated. The teacher was taken to the hospital for inhalation therapy. The fireman cleaning up the spill dissolved his shoes. About fifteen squares of linoleum were also lost. (1456)

Other cases include: 1080, 1096, 1108, 1195, 1198, 1269, 1312, 1357, 1363, 1423, 1479

Substitution of Reagent

1448. While student teaching the supervising teacher was doing a routine demonstration on fire extinguishers using vinegar and baking soda. After performing the demonstration for a few periods he ran low on vinegar. He clearly understood the reaction as being simply an acid reacting and evolving carbon dioxide gas and providing pressure to propel the solution towards the fire. When the vinegar was gone he simply substituted dilute hydrochloric acid for the vinegar. His definition of dilute was 50% hydrochloric acid 50% water.

As the reaction began the flash exploded in the teacher's face. He was taken to the hospital, I took over the class. (1051)

1449. IPS has a neat experiment, destructive distilling of wood. Fifteen years ago I modified that lab for the destructive distillation of tobacco. One of our teachers had his students do the lab with loose tobacco he had brought. The test tube containing the tobacco blew up and one student suffered glass injury.

The cause of the accident was that the tobacco was packed in the test tube instead of being loose. The result was that on heating the plug of tobacco slowly from the bottom the plug held the stopper connection at the top. Also the teacher did not do the experiment before trying it in class. (1497)

Other cases include: 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459

Substitution by Accident

1450. In high school, I substituted acetone for a reagent by accident and took some ceiling tiles out. In college, I got mildly sick from some bacteria experiments. (1019)

1451. A student was working in the storage room handing out equipment. A request was made by another student for some ammonium hydroxide. This is kept in eye droppers with labels and is extremely dilute. All eye droppers were empty so the student looked in all the cabinets for more. The room has 75 students doing various labs and class work, and three teachers.

The student discovered a gallon bottle of ammonium hydroxide concentrated and was about to pour directly from the gallon bottle to the eyedropper when I saw what was happening and stopped him. (1030)

1452. During my student teaching days my cooperating teacher was preparing a solution but mistakenly used the anhydrous form of the compound. When the compound was poured in the solution there was a violent reaction resulting in damage to the ceiling. The teacher was not injured. (1060)

1453. Students were instructed to place small (match head size) amounts of various oxides, carbonates, etc. in 3% hydrogen peroxide to see which ones were effective catalysts. The teacher left the bottle of 30% hydrogen peroxide he used for the dilution on his desk. One of the students used that. Manganese dioxide in the thirty percent solution yielded a highly exothermic reaction that shot to the ceiling. Several students were sprayed with the reaction mix. The ready availability of the acid was the major problem. (1198)

1454. A teacher was doing a calorimetry lag with 1N sodium hydroxide and 1N sulfuric acid. One student put 50 ml of sodium hydroxide pellets in a graduate and was about to pour it into 50 ml of concentrated sulfuric acid when the teacher stopped him. The teacher never should have left the concentrated acid or the hydroxide pellets to be accessible to the students. (1199)

1455. Directions for testing liquids for flammability in ninth grade IPS Physical Science: "Take a 10-cm square of paper towel, twisted; place tip into solution being tested. Light the tip with a wooden splint, holding it over a bucket of water"

The student took a 10-inch square of paper towel, loosely folded and poured the unknown solution, which was isopropanol, over the towel. She lit it directly from the micro burner with no water bucket and the sink blocked by IPS 1 x 2 foot peg board.

A vigorous high flame developed instantly. The student was startled and reached over the pegboard to drop the burning paper in the sink, igniting her polyester blouse en route. After a moment of chest slapping and wet paper brought by a student across the table the fire was extinguished and the student calmed down. The charred blouse, filled with holes, went into the trash and her gym blouse was worn home. A safety shower and eyewash were installed the next month. (1457)

Other cases include: 1323

Sulfuric Acid

1456. In a high school stockroom in 1987, a student lab assistant was helping with clean up and she carelessly poured some concentrated sulfuric acid into a sink. Some acid splashed on her face. She was wearing goggles and she used the shower immediately. Nevertheless, her face was seriously burned. (1182)

1457. In 1969 in a college chemistry class was using 25 ml graduate cylinders to measure 5ml of sulfuric acid concentrate. Charlie made a quick arm movement and the 5ml of sulfuric acid went flying out, spraying three young ladies. I looked up to see one of the young ladies run out of the room to the girls' room.

On the first day we had a lab on safety. They did recall it and remembered to wash. Why did they run to the girls room and not
the use the wash? The lab was designed in 1917 and safety considerations were not in vogue then. (1213)

1458. In 1978 a student in a second year chemistry class was transporting a high concentration of sulfuric acid to his work station. Another student bumped into him spilling the contents on both of them. Both were wearing aprons and face masks. The apron only covered to the knees. Both were placed under the shower diluting as well as possible. The girl was wearing nylon stocking which disintegrated. They were difficult to remove and continued to burn.

For a few years after that I was able to hold up a pair of the boy's jeans to show what remained. Each year there was less and less to hold up and show the class. (1215)

1459. The heating of concentrated sulfuric acid in a new beaker. The sulfuric acid superheated and erupted on the student. This happened in the lab at Queen's University in Kingston, Ontario, Canada. (1246)

1460. The injured was a sixteen-year-old male, a junior in an AP chemistry class. He was spattered with concentrated sulfuric acid when he dropped a 250-ml glass stoppered bottle onto the lab bench top. The bottle did not break. Acid was bumped from the bottle neck on impact with the bench top striking the youngster in the face and eyes with droplets of the liquid. Several other youngsters nearby received droplets on their clothes but were physically uninjured.

The teacher removed the victim to the emergency eyewash fountain within an estimated five to ten seconds after the event. Flushing was begun and continued. The school nurse and the department chairman were summoned. The student was removed to a local hospital for further treatment by the volunteer ambulance corps. The student returned to school several days later without suffering eye damage but with a few superficial acid burns. All students in the qualitative analysis lab were wearing chemical splash goggles. (1316)

1461. A sulfuric acid burn on the forearm of a student. The student was an eighth grader taking the I.S.C.S. level two course.

There was acid spill which was not immediately cleaned up. The lad rested his arm unknowingly in the spill and reacted when it began to burn.

The area was washed thoroughly with water. A paste of sodium bicarbonate was applied to the affected area. The student was sent with another boy to the nurse's office.

The teacher had to reemphasize the importance of immediate clean up of all spills including water. (1319)

1462. In a high school chemistry class in 1977 a girl knocked over a graduate cylinder containing sulfuric acid. Some of the acid spilled on her arm and hand. She was wearing short sleeves.

She quickly began to run water on the burn and while she did this she leaned into the puddle of acid on the desktop and laid her good arm into it.

She retuned to school with bandages on both forearms. (1330)

1463. Around 1976, we were doing a lab experiment dealing with comparing the reactions of concentrated sulfuric acid with dilute sulfuric acid. The students had been warned about the hazards and were told to follow these rules: 1) Place the concentrated sulfuric acid containers toward the back of the lab bar so it would not spill or fall off. 2) Wear long lab aprons and goggles. 3) Wash any area well with water that the sulfuric acid, either the dilute or concentrated, might have splashed on. 4) Point out the availability of paste of sodium bicarbonate to put on skin or clothing if the sulfuric acid gets on it. 5) Advise the instructor immediately of any spilled sulfuric acid.

The student had 25-ml graduated cylinder with 15-20 ml of concentrated sulfuric acid in it near the front edge of the lab bar. She knocked it over onto herself, burning her skirt, legs and ankles. We diluted the burns with water, took off her hose and shoes and put on a paste of sodium bicarbonate. She was taken by the emergency squad to the hospital for treatment. Fortunately just a few small blisters formed with no permanent scarring. (1355)

1464. As a college chemistry student, the student at the lab station next to mine spilled the sulfuric acid we were each using in individual experiments, on the floor. She knocked over the container. The acid splashed on her foot and lower leg as the container hit the floor.

Fortunately she was wearing heavy slacks and snow boots so the acid only lightly touched her skin. I recall her immediately going to and using the lab safety shower so we must have received good instructions about safety procedures.

As I look back on the incident I wonder if the instructor realized how awkward this student was as she was physically impaired and had only limited movement of her left arm. (1401)

1465. When I was in high school we were doing an experiment that involved using small amounts of concentrated sulfuric acid. To get my beaker out of the way to protect it from spillage, I stuck it in the deep sink. Unfortunately I forgot it was there and only minutes later I turned on the water to rinse something off. SPLAT, acid sprayed over me, my clothing and my books. I received only minor burns since I washed immediately. I did ruin a nice pair of slacks. (1409)

1466. In the mid 1960's a female chemistry student suddenly screamed during the lab experiment. It was a scream of pain, not ecstasy. She had her hands over her eyes. I grabbed her arm and pulled her to the eyebath about ten feet away and began flushing her eyes.

A boy working across the table from the victim had lifted the bottle of concentrated sulfuric acid from the acid base tray instead of removing a dropper-full as

directed. The bottle dropped, broke and splashed acid into the victim's eye. The district had not furnished goggles for science classes at that time.

Fortunately no permanent damage resulted. (1448)

1467. While I was an undergraduate student as a chemical education major, a part of my methodology course required that I perform a chemistry demonstration in front of the class. The demonstration, that I elected to do, required 200ml of concentrated sulfuric acid.

The method instructor informed me that the chemistry department would supply me with the chemical. When I approached the chemistry department they claimed to be unaware of this arrangement. I returned to my teacher who re-sent me to the department.

The shuffle continued for several days along with the assignment deadline coming closer. So, armed with the ignorance of an undergraduate and the fear of the red pen I placed a 250ml Erlenmeyer flask containing conc. sulfuric acid in my coat pocket. While I was leaving the lab a friend called to me. As I turned to recognize him, my coat hit against the doorknob and the bottle shattered. Thanks to the wonders of water I was not injured but my clothing - all of it--promptly disintegrated. It was a cold walk home.

Note: I changed to a different demonstration! (1469)

1468. A student tested concentrated sulfuric acid with litmus paper. Since there was no change he assumed there was no danger. He threw the litmus paper with concentrated sulfuric acid at another student. The paper hit her on the chest and burned a hole in her shirt. By then I was drowning the area with plenty of water. (Student A is a neurosurgeon today!)

Error: Student not understanding that indicators only indicate when sulfuric acid is dilute. Care is now made to ensure that students now understand this before handling acids. (1481)

Other cases include: 1109, 1172, 1174, 1177, 1213, 1214, 1237, 1243, 1248, 1296, 1345, 1403, 1441, 1469, 1475, 1500

Test Tube Heating

1469. In a chemistry lab in 1969 a boy was heating sulfuric acid in a small test tube. He kept heating it and finally the acid was propelled out of the tube onto the back of the girl at the next table. There were small spots on her back right through her blouse. (1202)

1470. In 1982 in a ninth grade advanced science class we were decomposing sodium bicarbonate. We were heating the chemical in a large bore test tube with delivery tubes. There was bubbling carbon dioxide gas produced through limewater. During heating about 80% of test tubes shattered within two minutes of each other.

Luckily all the students were wearing goggles and no one was hurt. Now I test the integrity of the test tubes prior to each lab. (1250)

1471. We run a special course for kids aiming to get on the International Chemistry Olympiad. Big prestige thing for the very best of chemically minded Youth. First lab session: Safety; how to heat a test tube containing water. There's this kid who manages to explode even that. And the fragments jump over five benches and hit the lab technician who is standing at the far end of the room in the back of the neck.

Does anyone know anyone, anyone at all, who will insure Chemistry Teachers? (1254)

1472. In a high school chemistry lab before goggles were used to any extent, and prior to any instruction in any course about hazardous materials and techniques, a student making an ester using an alcohol, an organic acid and concentrated sulfuric acid. He chose to smell the product. The contents of the test tube boiled up into his face. Fortunately injury was minimal. (1379)

1473. A student heated a test tube with fluids in it. The result was an explosion of the liquid in his face. He had his goggles perched on his hair. The copper sulfate splashed around his eyes but not in them. Fortunately he was not hurt but he and the other students got the point. ALWAYS wear your goggles and listen to safety requirements.

This happened in April 1988 in a high school chemistry class. (1425)

1474. The student next to me had potassium perchlorate in a test tube, added concentrated sulfuric acid, and heated it holding the tube at an angle. I was showered with the debris. My lab notebook and lab coat never were the same. He did not read the directions. (1470)

1475. Seventh grade students were heating a test tube containing iron and sulfur to observe the chemical change. The test tube cracked spilling the smoldering contents on the floor. Water was poured on the smoldering mass forming sulfuric acid vapors which we all inhaled.

Anticipation about the possibility of such an accident would have prevented the error and resulted in a safer clean up. (1472)

Thermite

1476. In an upstate New York school around 1978 a substitute chemistry teacher authorized a student to perform a thermite experiment. The student was told to do it outside.

The student went outside to a grassy area, poured out the thermite mixture with thermite starter on top. A twisted magnesium ribbon was placed in the center of the cone.

The student was not wearing goggles, protective outerwear or gloves.

He bent down to light the magnesium with a match and it would not ignite. After several tries it appeared to start then stop. The student bent down to relight it and inspect it. The cone erupted splattering his face, chest and arms. No adult supervision was around. When water was doused on him he continued to scream as magnesium burned on his skin.

Although the hospital was next door and the ambulance came quickly permanent damage was done and much time was needed for recovery. (1153)

Thermostat Failure

1477. Bakelite screw cap test tubes were being sterilized in an oven when the thermostat failed and overheated. The Bakelite was glowing like charcoal when the oven was opened and burst into flames when the air entered. A Halon fire extinguisher, the only one in the lab, was used. Immediately the room was filled with a suffocating gas smelling like bromine or chlorine or phosgene. The room had to be evacuated and smelled for days thereafter. (1460)

Titration

1478. In a biology classroom students were titrating dilute sodium hydroxide into a mixture of water which had carbon dioxide gas bubbled into it. One of the students claimed that the sodium hydroxide splattered into her eye. The teacher immediately had her rinse her eye with an eyewash and then sent the student to the nurse for further observation. (1289)

Other cases include: 1299, 1352

Transportation by Cart

1479. As a lab technician I was preparing to empty the waste collection bottles from each lab into larger waste containers stored outside in a waste cabinet. The bottles for toxic waste were on a cart. When I pushed the cart across an uneven stone foyer floor one of the bottles fell off the cart landing on the corner of the lid, breaking it. The contents were splattered everywhere making clean up difficult. (1187)

1480. Science teachers often need to run from room to room and carrying materials on carts. A student was running around a corner and ran into the cart knocking over and breaking three jars of chemicals. Fortunately all were relatively unreactive with each other but what if they had been! (1486)

Unauthorized Procedure

1481. An organic teacher had, during a lecture, mentioned the preparation of "torch powder." A student working as a lab assistant decided to try to make some without permission and without the recommended concentrations and amounts. While trying to scrape the drying powder together off the filter paper, the powder exploded spewing particles all over the lab and into the face of the student. (1039)

Vacuum

1482. In a biology lab, a student was asked to hold a rubber hose from a vacuum attachment down the drain so water would not splash. The student pinched the rubber hose, which exploded and burst with a loud report. No great damage was done other than fright and getting the student wet. (1099)

1483. In a ninth grade Physical Science class in 1987 a teacher, who had taught for thirteen years, used a bell jar in a vacuum demonstration as she usually did. The difference this year was the jar had a hairline crack, which she had seen. As she held the jar up to begin the demonstration, the glass shattered causing the need for stitches in three places. (1123)

1484. I was evacuating a 3L vacuum flask using an aspirator hooked to a lab sink. Even though the vacuum could be no less than vapor pressure of water this very thick flask imploded and sent glass flying in all directions. Fortunately I was not hit.

The problem was the shape and size of the flask. I had a false sense of security in the thickness of the glass. Flask should have been contained with tape or some plastic holder.

Implosions are as bad as explosions. (1275)

1485. A sealed glass tube containing isoprene (2-methylbutadiene) exploded and pieces of glass were imbedded in my face. They were picked out in the hospital and no permanent damage resulted. I was wearing safety glasses.

The cause of this accident was that in sealing the glass tube, which was done by cooling the tube and contents in liquid nitrogen while pumping to remove air and then sealing with a torch, a pinhole was left. Air entered and was subsequently sealed in the tube. When the tube warmed up to room temperature the liquid air vaporized, expanded and the tube broke.

It could have been prevented by taking more care when dealing with substances under vacuum. Use a hood when handling such substances. (1297)

1486. While working from the N.Y.C. curriculum guide "Science Grade 9-Reactions of Metals". The problem was "How can metals be extracted from carbonate ores?" Part of the directions were:

1. Heat some copper (II) carbonate (10-25 grams) in a Pyrex test tube equipped with a one-hole rubber stopper and delivery tube.

2. Pass the formed carbon dioxide gas into an eight-inch test tube which has been one third filled with lime water.

On completion of the experiment the test tube shattered. Fortunately, no one got hurt.

Looking back I realized that as the experiment cooled down a vacuum was created with the limewater going up the delivery tube. The Science Bureau was contacted to issue a caution on this particular experiment. To my knowledge it stands as is. (1309)

1487. I was using an Erlenmeyer flask. The vacuum that formed imploded the flask with glass flying everywhere. I should have used an explosion shield, goggles and a heavy Florence flask to with stand the vacuum. (1496)

Other cases include: 1031, 1286

Ventilation and Indoor Air Quality

1488. I wonder about what we don't see; the poisoning and cancer that results slowly over time and is not measurable. Our school is almost unvented. Between the shop, the art room, the science room and the janitors burning the garbage, the indoor air is poison. It is not accidents, it is slow poison. (1021)

1489. Small bottles of ammonium hydroxide and hydrochloric acid were given to students along with two cotton balls and a 4-cm diameter by 100-cm long clear plastic tube. Each group was to apply chemicals to cotton balls, place into the ends of the plastic tube, stopper it and watch formation of NH4Cl cloud ring at some point between tube ends. The students were slow in inserting the cotton balls into the tubes and an ammonium chloride cloud slowly formed within the room. Ventilation was not adequate to remove the cloud. The lab was aborted at this point and the students deposited the cotton balls into a water bath. As they did even more ammonium chloride was evolved. The classroom was unusable until the cloud could diffuse out the window. I wonder about the health effects of ammonium chloride? (1034)

1490. Ventilation, or the lack of it, is our most serious health problem. The sections of window open as a unit. The lower section allows the breeze to blow directly on the working stations. It is almost impossible to have the windows open while Bunsen burners are being used. (1280)

1491. The biggest problem is our ventilation system. Rather, the lack of an efficient one. There are numerous days of the year when the blower doesn't work. The administration and maintenance personnel say we don't need the air exchanged. I have contacted the state OSHA agency about this but they did not or could not get the situation corrected. (1431)

1492. The most serious problem I have is a total lack of ventilation in the science labs. There is one fume hood in the lab which will remove air from only the extreme rear of the work area. There is no front shield to prevent outside air currents from forcing generated gases out of the hood. The fan motor, when it is working, pulls a sufficient volume of air but without the front shield it just does not work well. The only preventative maintenance occurs when I inform the maintenance department that the fan is not working. (1433)

Other cases include: 1015, 1032, 1056, 1059, 1086, 1127, 1128, 1144, 1145, 1146, 1179, 1231, 1232, 1246, 1250, 1271, 1272, 1282, 1287, 1345, 1348, 1353, 1431, 1472, 1477, 1485, 1497, 1499

Washing Glassware

1493. September, 1988. Students were cleaning their lab kits. One student left a broken piece of test tube in the bucket of hot soapy water. Another student reached in the water thus puncturing her middle finger. All safety procedures of first aid were followed. The student's finger bled for about four hours before it stopped even after applying direct pressure the entire time. It was recommended she go to the hospital but she refused. (1343)

Other cases include: 1012, 1027, 1223, 1320, 1407, 1422

Water Reactive

1494. In 1963 a high school chemistry class was working on the preparation of ammonia from heating ammonium chloride and calcium hydroxide in a large test tube with a glass bend in a rubber stopper.

The glass bend was put in water while the test tube was heated. Water went into the test tube and caused an explosion. (1002)

Other cases include: 1063, 1104, 1172, 1174, 1177, 1180, 1213, 1237, 1282, 1333, 1334, 1343, 1398, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1447, 1465

Wood Shop

1495. In a wood shop class a student lost a finger in a saw incident. There was a law suit which was lost by the student based on the fact that the correct technique was demonstrated to the student by the teacher. This happened in the fall of 1986. (1398)

Other cases include: 1204

Wood Splints

1496. The students were doing an experiment where they were identifying the properties of oxygen. They were using wood splints. After testing to see whether oxygen was combustible one student threw his wood splint into a garbage can full of paper towels. The paper towels went up in flames. A student who was near knocked over the garbage can and threw a pail of water into it. He stomped out the fire. The fire alarm went off. (1300)

Other cases include: 1455

Working Alone

1497. A research student was working on a project in the lab late one afternoon and didn't show up at a meeting with a friend. When the friend went to look for the student she found him lying on the floor in the lab. The student had been working in a fume hood but with the shield up so that they could add chemicals while the reaction was proceeding. The toxic gases generated during the procedure had been inhaled by the student. Fortunately he was found soon enough to prevent serious permanent damage. (1038)

1498. We had installed steel shelving in our prep room to hold glassware and equipment. It was full. One summer I decided to rearrange the shelving to achieve better traffic flow. I proceeded to move units without removing the contents. I was also working alone. Suddenly a ten gallon aquarium crashed down on my head. It was on the top shelf. I nearly lost consciousness and suffered a fairly deep scalp wound. Some six months later I pulled a piece of glass from the healed wound. (1157)

1499. During the 1987-88 school year an honors chemistry student was working alone in the high school chemistry lab performing a qualitative analysis experiment. He purposefully generated some chlorine gas to use in a test. He did this under the hood but used too much reactant and became alarmed at the amount coming off. The hood was not exhausting fast enough and some gas was escaping into the room. He notified two teacher in a nearby office who enclosed the apparatus and quickly moved it outside where the gas stopped being generated in about twenty minutes. (1221)

1500. A teacher was refilling a bottle of concentrated acid he thought was sulfuric but was instead hydrochloric. The resulting pressure and heat generated sprayed acid into the face of the teacher. Bottles had been moved over the summer by the custodian while cleaning. The teacher did not check the labels. He was not wearing goggles and was working alone. (1378)

Other cases include: 1112, 1127, 1144, 1192, 1273

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APPENDIX I About the Editors

Teresa R. Robertson, currently providing instructional support to the Department of Natural Sciences and Mathematics at the California State University in Bakersfield, also served as the first Chemical Hygiene Officer for the campus, from 1996 to 2002.

For two decades prior to her employment in academia, Teresa was a quality assurance supervisor and chemical hygiene officer in the petroleum and agricultural industries of Kern County at the southern end of the San Joaquin Valley, and an analytical chemist for a state-certified testing laboratory.

The quest for self-improvement lead to seminars given by the American Chemical Society, which in turn lead to certification by the National Registry of Certified Chemists as a Chemical Hygiene Officer and membership in the National Association of Chemical Hygiene Officers. Teresa is also a member of the National Association of Scientific Materials Managers.

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 in 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 II 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 50,000 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 4,000 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: labasfe@aol.com.

APPENDIX III How You Can Help

The Laboratory Safety Institute gratefully acknowledges the generous support of our sponsors. Since 1978, 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, Pfizer Corporation, 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?"

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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.

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