Alberta Palaeontological Society

Bulletin

VOLUME 6 NUMBER 1
MARCH 1991

ALBERTA PALAEONTOLOGICAL SOCIETY

The Society was incorporated in 1986, as a non-profit organization formed to:

a. Promote the science of palaeontology through study and education.
b. Make contributions to the science by:
    1) discovery
    2) collection
    3) description
    4) education of the general public
    5) preservation of material for study and the future.
c. Provide information and expertise to other collectors.
d. Work with professionals at museums and universities to add to the paleontological collections of the province (preserve Alberta's heritage)

MEMBERSHIP: Any person with a sincere interest in palaeontology is eligible to present their application for membership in the Society.

Single membership	$10.00 annually
Family or institution	$15.00 annually

THE BULLETIN WILL BE PUBLISHED QUARTERLY: March , June , September , and December. Deadline for submitting material for publication is the 15th of the month prior to publication.

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NOTICE: Readers are advised that opinions expressed in the articles are those of the author and do not necessarily reflect the viewpoint of the Society.

This month's cover: from Jeff Doten

PRESIDENT'S MESSAGE

by Percy Strong

My Christmas message had three wishes. Let us have a look at them again to see how the Society has fared.

The first wish was participation in the Society. That has not changed much. To encourage this, I have asked the directors to ask members to assist them in their duties and planning for the upcoming year. This will give the membership a greater awareness of how vital their help is.

The second wish was setting up instruction in the basics of palaeontology It is still on the drawing board, suffering from the lack of an education director to spearhead the plan. At this point in the year, we will have to wait until next fall to begin any meaningful and coherent series of lectures. I plan to send out a questionnaire in the next few months to get an idea of the things that you would like to see in the courses.

The third wish was setting up winter field trips. It has also fallen by the wayside - but only put on the back burner because planning for summer field trips has taken precedence. I am sure that Wayne Braunberger would enjoy having an assistant to help him work out the logistics for these trips. However, it is still not too late to help out with some **winter** field trips, as our summer season does not start until June.

I am adding a fourth wish to the list - maybe it will arrive in time for next Christmas. That wish is that we increase our membership. Increasing the membership will make the workload a lot easier for us all. It will also increase our pool of ideas for making the Society prosperous and an enjoyable experience.

FIELD TRIPS 1991

by Wayne Braunberger

Once again the Society will be offering three field trips to various areas in Alberta. Field trips will be held on the date specified, but if the weather turns bad they will be held on the following day **if possible**, if not, they will be held the following week. Most trips will involve a moderate amount of walking and we will be away from our vehicles for most of the day, so bring along your lunch, water, and rain gear. The trips are planned as one day excursions out of Calgary. You are welcome to spend the weekend in the area and visit the sites on your own.

TRIP 91-1: June 15, 1991, Adanac Mine/Carbondale River

Leader: Wayne Braunberger (278-5154)

Localities in this area are Jurassic and Cretaceous Numerous excellent exposures can be found along the river and in the mine. This area is a classic Foothills locality, and the stratigraphy and sedimentology of several units can be observed. For those who are interested, the structural geology of the area is also well exposed. The most common fossils are bivalves, ammonites, and belemnites There are also some well preserved logs in the mine.

TRIP 91-2: July 20, 1991, Morrin/Munson Badlands

Leaders: Les Adler (289-9972) & Alex Harich

This trip will be to the badlands along the Red Deer River near the Morrin Bridge and the Munson Ferry. We will be going to look at several bone beds that are exposed. Part of the purpose of this trip will be to determine why the bones are deposited here.

TRIP 91-3: August 17, 1991, Location to be determined

At the time of this Bulletin, a location for this trip had not been determined. Any ideas of where we could go would be welcome.

- Before attending any of the field trips, please contact the leader, or the field trip coordinator: Wayne Braunberger, 278-5154.
- At the March, April, and May meetings there will be a sign up sheet for each trip.
- If you have indicated that you will be attending a trip, and later have a change of plans, please let us know that you cannot make it.
- Phone Wayne and let him know your interest in attending any of the trips.

IN THE NEWS

Calgary Herald, Jan. 6, 1991, p. C9: Great lizards globe-trotters.

Summarizes some findings of the Canada-China Dinosaur Project regarding migration of dinosaurs.

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Calgary Herald, Jan. 10, 1991, p. B3. Feds drop export charges after five-year legal battle.

Discusses the resolution of a dispute between Rene Vandervelde, president of Korite Minerals, and federal authorities over charges filed under the Canadian Cultural Property Export and Import Act.

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Geotimes, Jan., 1991, p. 6. Ice Age fossils reveal ancient environment.

Discusses a find in a peat bog in central Florida that contains a concentration of well preserved Pleistocene fossils, including an eight foot section of mammoth tusk.

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Ongoing situation in the USA regarding fossil collecting rules for lands under the control of the Bureau of Land Management and The Forest Service.

In 1990, a consensus agreement Policy was reached by the BLM, Forest Service, professional paleontologists, commercial dealers, and amateur representatives. The Policy approved continued multiple use of public lands, including fossil collecting for scientific, educational, and recreational purposes. In late 1990, the Policy was delayed by groups that felt that only certain people should be allowed to remove surface and subsurface fish fossils, shark's teeth, and vertebrate remains. In January, 1991, the new Policy was cancelled.

Groups such as the Mid-America Paleontological Society (MAPS) were circulating petitions calling for a reversal of the cancellation of the consensus Policy.

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Earth Science, Fall, 1990, p. 6. Lake-bottom "forest" mapped.

Discusses an underwater "forest", about 8,000 years old, found in Lake Michigan off Chicago by the USGS.

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Earth Science, Fall, 1990, p. 10. Evidence of hind limbs of whales found.

Discusses the find in Egypt of a 40 million year old, 50 foot long whale skeleton that includes both foot and hind limb bones. Whales had returned to the sea 10 million years earlier, so it is surprising to still find evidence of hind limbs.

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MAPS Digest, Feb. 1991, from Insight, Sept. 24, 1990. Oldest known mammal found in Texas.

Discusses what is believed to be the skull of the oldest known mammal, discovered in Texas. It probably belonged to a five inch long, rodent-like animal, and is believed to be 220 million years old, 10 million years older than the next oldest mammal fossil.

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Earth Science News, Feb., 1991, p. 9. Diver discovers Superior nugget...

Discusses the implications of the report of a diver of the find of a worked copper deposit beneath Lake Superior. It may mean that man was in North America 10 or 15 thousand years earlier than 4000 to 5000 BP (the currently accepted dates), because the deposit would have to have been worked prior to the last glacial advance.

A FORCEPS FOR HANDLING MICROFOSSILS
by Howard Allen

Anyone who collects microfossils has experienced the frustration of picking specimens from a sand sample or acid-etch residue. The usual methods of picking with a wet, fine-pointed paintbrush or attempting to push specimens into position with a steel needle have drawbacks, which soon become obvious. The wet paintbrush is fine for picking up an isolated foram from a tray, but what happens when you want to drop the fossil into a micromount or vial? The fossil clings to the brush with a maddening tenacity, requiring much dabbing and stroking of the brush tip across the edge of the receptacle. As often as not the specimen, being wet, then clings to the edge of the vial, requiring more prodding with the brush. If it doesn't then stick to the brush again, it may well break free suddenly, soaring across your desk and into the carpet: ashes to ashes, dust to dust...

The sticky brush syndrome reaches its ultimate manifestation when one attempts to pick a specimen from a sample strewn with closely spaced sand grains, other fossils, and miscellaneous debris.

Using a steel probe or needle to manipulate specimens in a sand sample will demonstrate the astonishing abundance of magnetite in sedimentary environments. Steel needles, if not already magnetized, will often become so over time. Oilwell drill cuttings are normally peppered with steel shavings from various parts of the drill-string. Replacing a steel probe with any sort of plastic will reveal the joys of static electricity.

What the microfossil enthusiast needs is some sort of forceps that will pick up a tiny and delicate specimen without crushing it to powder. The tool described herein fits the bill in most situations. I invented my "foram forceps" several years ago, after one too many sessions with a No. 00 camel-hair brush. The prototype was so effective that I haven't made a single modification. Materials and tools required are minimal, and easily available around most households. As a result, the price is practically nil.

REQUIRED MATERIALS

- Scrap sheet aluminum, 142 mm x 8 mm x 0.5 mm thick (the gauge used for heating ducts and flashings)
- Scrap heavy gauge aluminum foil, 60 mm x 8 mm (the type used in disposable aluminum pie plates)
- "5-minute Epoxy" glue
- Heat-shrink tubing, 6.4 mm (1/4") diameter
- Tin snips
- Power drill with 1/8" bit
- Hard steel needle or wire (approx. 1-1.5 mm thick)
- Small tack hammer or hobby hammer

The measurements given are based on my prototype, which was thrown together with little consideration for precise dimensions. The sizes can be adjusted to suit the user.

Trim the aluminum scraps to size and taper one end of each to a point (Fig. 1). Bend the long strip of sheet aluminum at the points indicated, and fold flat (Fig. 2). Place the strip of aluminum thus folded on a smooth, hard surface (such as a plate of steel, or the top of a bench vise). Position the tip of the steel needle or wire on the tip

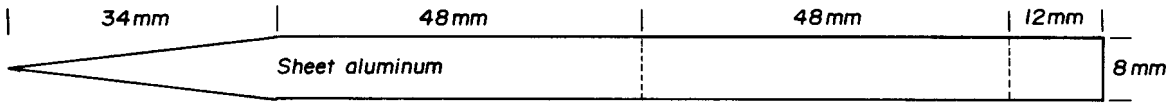
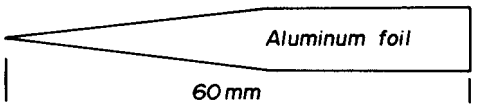
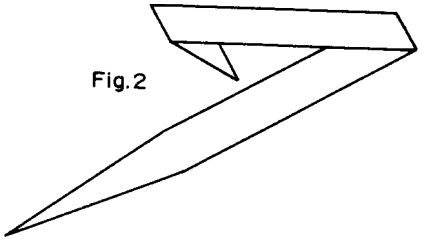
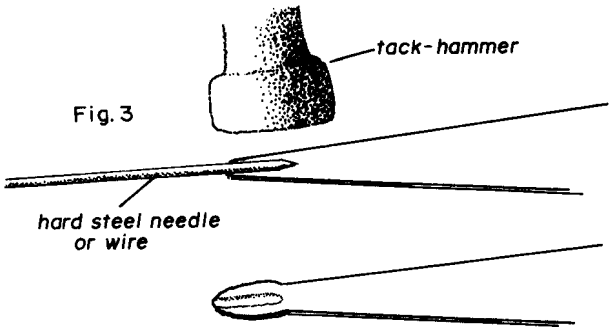


Fig. 1



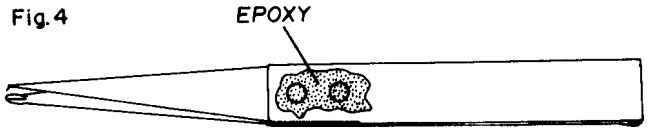
of the folded aluminum strip as in Figure 3 and strike sharply with the tack hammer (you may want to practice this step on some other scraps of aluminum; I managed to get it right the first time). This causes the tip of the forceps to have a small groove and to be slightly splayed out, which facilitates the holding of round, slippery specimens and keeps them from squirting out sideways.

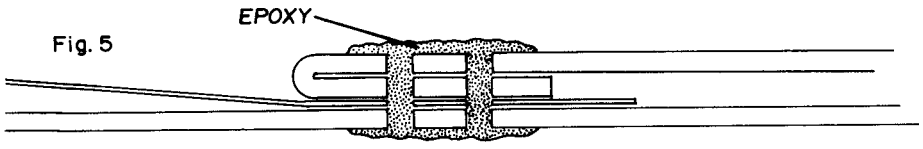




For the next step, slip the strip of aluminum foil under the folded-over end of the first strip, lining up the points so they are parallel and superimposed, forming the second blade of the forceps (Figs. 4, 5). Ideally, the two strips would now be soldered together, but of course aluminum won't solder, so the next best thing is to drill two *1/8"* diameter holes through the forceps (make sure the two strips of aluminum don't slip while drilling). Mix a small amount of "5-minute Epoxy" and spread liberally over the holes on both sides (Fig. 4). This creates two epoxy "rivets" (Fig. 5), which are more than sufficient to hold the pieces together.

When the epoxy has hardened, place the tip of the forceps under the microscope and, with a regular, pointed tweezers, bend the very tip of the foil strip into a slight hook (Fig. 6; the "hook" is exaggerated here for effect) to keep specimens from squirting out the tip of the forceps. If the thin foil blade of the forceps isn't already bent slightly away from the lower blade, carefully bend it up (not too much; it's easier to bend up than to bend back down). Finally, place a length of heat-shrink tubing (available at electronics supply and many hardware stores in a variety of colours) over the body of the forceps (Fig. 7) and shrink into place with a hot blow-dryer or cigarette lighter (may be sooty).





(Cross-sectional view: not to scale)

Fig. 6

(tip detail)

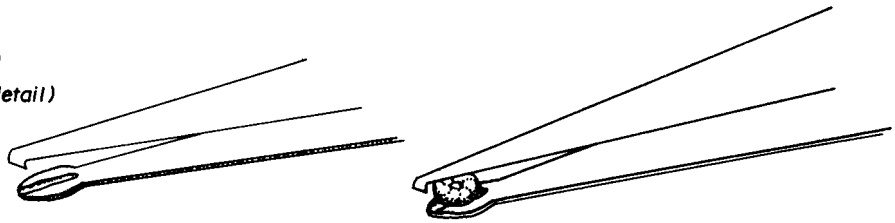
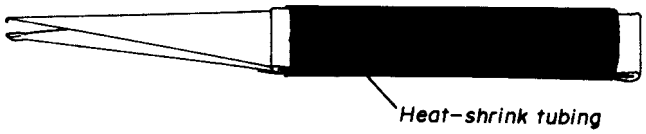


Fig. 7



The completed forceps is immune to stickiness, magnetism, and static charges. I grip mine between the thumb (bottom) and forefinger on the forceps body, and operate the thin blade with my middle finger on top. The thin, springy upper blade holds tiny specimens firmly but with very little pressure, no matter how hard the middle finger is pressed down on the base of the blade. All types of microfossils from microvertebrate teeth down to the smaller planktonic foraminifers may be safely handled with this tool. The only types of specimens that require special caution are some extremely thin walled, leached or delicately spined ostracodes and some very brittle acid-wash residues; most forams are surprisingly robust and can be picked quickly and easily. The forceps itself, being lightly constructed, may be damaged by snagging or bending, but if stored in a small box or cardboard sleeve and handled with care, should provide many months to years of service.

REVIEW from Les Adler
(from Newsweek, Nov. 19, 1990)

Jurassic Park, by Michael Crichton, Knopf Publishers, 400 p.

This book is in the form of a novel, but uses the latest theories from physics, paleontology, computing science and genetic engineering to develop a thriller with a climax.

A multimillionaire has bought an island off the coast of Costa Rica and transformed it into the world's largest theme park devoted to dinosaurs. From fossils preserved in amber and using giant computers that work out the genetic codes, technicians have developed live specimens of tyrannosaurs, poison-spitting dilophosaurs, and alarmingly intelligent velociraptors Despite computers, electrified fences and constant surveillance, which are supposed to keep everything under control, the systems break down and the whole place goes haywire, with the help of an uncooperative scientist.

There is a professor of paleontology who appears to be a close associate of Jack Horner and who acts like Harrison Ford, so Stephen Speilberg has already started on the movie version.

Chaos theory and genetic engineering with controlled reproduction, violence and treachery, and warm-blooded ancestors of birds ensure that the story moves rapidly and that a suitable climax eventuates.

PROGRAM SUMMARIES

by Heather Whitehead

DECEMBER 14, 1990

Percy Strong, APS President, on The Paskapoo Formation and its fossils

There has been very little written about the Tertiary Paskapoo Formation and its fossils, and the literature is generally older than the 1930's.

The Paskapoo Formation is discontinuously exposed in Alberta and Saskatchewan. Calgary is near the axis of the Alberta Syncline, and about 2400 ft. (730 m) of Paskapoo are preserved here. The original thickness is unknown, as the top was eroded and later disturbed by glaciers. The Paskapoo is made up of interbedded sandstone and shale, with some massive sandstone interbeds, which have been quarried for building stone. The Paskapoo was deposited in a fluvial (river) environment, and has a mixture of higher energy (channel) and lower energy (interchannel) deposits.

The Paskapoo contains volcanic ash layers, which date it at 66-58 million years old. It is younger than the Scollard Formation (the last Alberta dinosaur-bearing interval), and is separated from the Scollard by an unconformity.

The fossils that Percy brought in were mostly collected in the Calgary area. They included large, beautifully preserved laurel leaves, freshwater bivalves and gastropods, crocodile teeth, and a possible mammal molar. The laurel leaves came from the base of a channel sand, a high energy environment, yet the preservation implies low energy. Reeds, collected from the Joffre Bridge area by Les Adler, also came from Paskapoo rocks. The Grand Prairie area has yielded Paleocene age freshwater fish from lake deposits in the Paskapoo.

JANUARY 18, 1991

Part 1, Harvey Neg rich on Setting up a collection

Harvey has set up both his own and the APS collections. Books on the subject are generally too technical for the average collector. His tips include:

- Narrow your interests, don't try to collect everything, unless you have unlimited storage space!
- Develop and use a system for recording your specimens. Specimen sheets encourage a systematic approach (catalogue number, common/scientific name, where found, formation/age, storage info, etc.)
- Mark each specimen with a number that cross references to the catalogue. Keep each specimen with a card that also shows the number, identification, and where found.
- Large samples can be numbered using Tester's White Enamel (hobby shops) written on with a technical pen (0.4 or 0.45 nib) and varnished when the number is dry. Keep sample and card in zip-loc bags.
- Very small specimens can be kept in cellophane coin holders.
- Before heading out to a new area, have an idea of what is to be found. The *Roadside Geology* series, and *Fossils in America* are good general references.

Part 2, Jeff Doten and Mike Skrepnick on Paleoart

Mike and Jeff gave a brief review of paleoart (with reference to the Mar/Apr '89 issue of *Equinox),* from the lively animals by Charles Knight pre-1900, to the slow and static post-1900 animals by Knight and others, to the recent, again lively, models.

There is a conflict between scientific illustration, the perfect accuracy sought by the paleontologists, and art, which needs some latitude for artistic impression (for example, the zebra-like stripes on Mike's T-shirt design for the APS - the artist applied an environmental adaptation seen in modern animals to an extinct one; it can't be proved or disproved).

The artist envisions the dinosaurs as living beasts by using modern analogues. Dinosaurs did not "stand, in profile, waiting to be painted". Paleorestoration used to be mostly of adults in predator-prey conflicts, but behavioral aspects are becoming common (pack hunting, adults and young together, battle scars, etc.). Variation is normal in nature, and the paleoartist needs to be able to portray this variation.

Mike and Jeff then described some of their art - the inspiration, and the methods used to produce a final work of art from an original idea.

FEBRUARY 15, 1991

Dr. Art Sweet, Geological Survey of Canada, Calgary, on Pollen and spore data at the Cretaceous-Tertiary (K-T) boundary

Pollen and spores are recovered from silt-sized sediments. Because they are only 1/100 to 1/10 mm in diameter, 20-50,000 can easily fit on one microslide. They are studied using Scanning Electron Microscopes, which show the sculpture, ornament and three-dimensionality of the samples, and by transmitted light microscopes, which show internal details. Spores are produced by ferns and mosses, pollen by gymnosperms (conifers) and angiosperms (flowering plants).

During the Late Cretaceous, spores and gymnosperm pollen were low in diversity, compared with pollen from angiosperms. At the K-T boundary, angiosperm pollens suffered a collapse in diversity, and during the early Tertiary, gymnosperm pollens and spores dominate collections. By the Eocene, angiosperm pollen had rediversified.

Simple pollen (wind dispersed) survived the boundary, but complex ones (insect dispersed) did not. This tells us that a major change in environment occurred at the K-T boundary.

The K-T boundary is recognized by evidence from extinctions, changes in biota, elemental geochemistry (iridium), boundary clay layers, shocked quartz, and stable isotopes. It could have been caused by external or internal events.

There is a section containing the boundary clay near Huxley, Alberta, which may qualify as the "type section" for the K-T boundary in terrestrial sediments. This section shows the two-layered aspect of the boundary (due to differential rates of fallout, if the impact theory is accepted), spherules (?microtectites), shocked quartz (perhaps the strongest argument for impact - this deformation in quartz is only found in connection with impact and nuclear blast sites). This site and many others were sampled for palynology and studied on various scales, to show changes in pollen and spores near the K-T boundary.

The scale of the study can affect the results. In the case of the K-T boundary, the smaller the scale, the more complex the results have been. At the largest scale, the record shows a constant, slow die-off in pollen and spores during the Late Cretaceous, which accelerates near the boundary. Regardless of the cause of the K-T extinction, this change must be explained. If the extinction was a single, sudden, external event, the change in diversity was unrelated to it, but if the extinction was the result of internal Earth causes, the diversity change could be related or unrelated.

At smaller scales, the complexity increases and there is no single, definable pattern to the rate of change. Dr. Sweet and colleagues plan to investigate the boundary pollens and spores at the millimetre level, in hopes of reaching a definitive answer.

Dr. Sweet illustrated his talk with slides, SEM photographs, and original cartoons, and with actual samples of the K-T boundary clay from Huxley. He also presented the club with a copy of the Fossil Poster, which was given as a door prize.

(Ed. note: see the back page for info on the Fossil Poster)

The Back Page

Congratulations to Harvey Negrich on his retirement, December 1, 1990.

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At the February meeting, Les Adler gave those present a detailed summary of the book *Wonderful Life* by S.J. Gould, about the Burgess Shale. A lot of effort went into the preparation of this, and the Bibliography that goes with it. Thanks to Les for a great deal of hard work, and to Alex Harich, who I understand helped with photocopying.

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PBS did a great three-part special on dinosaurs in February, 1991, on the program Nova. Watch for re-runs if you missed the shows. All the best and brightest dinosaur researchers were featured, and the latest technology, including animation, was used to keep the programs lively and interesting.

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The Fossil Poster mentioned elsewhere in this issue is available at the Institute of Sedimentary and Petroleum Geology, Maps and Publication Sales Office, 3303 33 St. NW, Calgary (call 292-7030 for open hours). It is an educational promotion aimed at schools, etc., but individuals can obtain one copy, which includes an informational booklet as well as the poster itself.

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Prior issues of the *Bulletin* have mentioned *Dinotour '91.* This tour is now sold out, but names are being accepted for a waiting list in case of cancellations. The tour, to sites of dinosaur interest in the western USA, runs June 1-8, 1991. For information, the contact address is: c/o 14 Varwood Place NW, Calgary, T3A OC1, phone (403) 288-7181.

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The Calgary Rock and Lapidary Club's Annual Show will be held May 4 (10 am to 9 pm) and May 5 (10 am to 5 pm) at the West Hillhurst Arena, 1940 - 6 Ave. NW, Calgary. The 1991 show will have plenty to interest the fossil lover as well as the mineral enthusiast. Admission: Adults $3.00; Students (7-17) & Seniors $2.00; children 6 and under free, if with an adult.

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MEETINGS

Meetings are held at Mount Royal College at 7:30 pm, usually on the third Friday of the month, in Room B108. Dates are:

April 19	(deadline for handing in articles for June *Bulletin)*
May 24	(June *Bulletin* will be handed out at this meeting)