



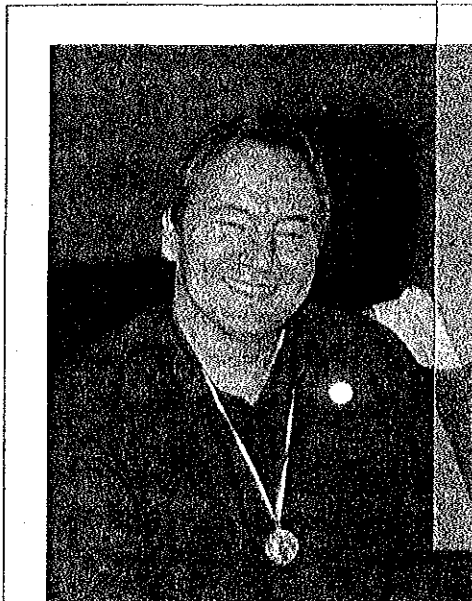
Ontario Archaeological Society

Arch Notes

New Series Volume 6, Issue 1

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January/February 2001



2000 Emerson Medal - Paul Lennox



2000 Kenyon Award of Merit - Martha Kidd

OAS news

President's notes	3
Teacher's edge	3
From the OAS office	5
2001 Call for Papers	7
MCzCR & Parks Canada	9
OAS Egypt trip dates	9
OAS chapters	24

Arch Notes feature

The Great Pyramid Revisited - 2001	
<i>H. van Lieshout</i>	12

Arch shorts

Don't bet the house and farm (Part 1)	18
Letters to the editor: Point-counterpoint	
<i>B. Mayer</i>	19
Digital OA	22

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Symposium

Hamilton 2001 - Brad Bandow

Volunteer Coordinator

Chair in place

...editor's note

The volunteer efforts of all involved in the OAS are now recognised – resulting in the new page 2 displaying not only the Board members but also the committee and publications volunteers.

The AN cover features Martha Kidd and Paul Lennox – the 2000 recipients of the Kenyon Award of Merit and the Emerson Medal respectively – Congratulations!

President's notes

THEOAS 50th Anniversary seems to have come and gone in a flash. We have celebrated and accomplished much in the past year including the re-establishment of a full-time Executive Director; a move to new corporate offices, a unique partnership with the Town of Richmond Hill, plus ever expanding public outreach and education programs. But where do we go from here? Jo Holden, our Executive Director, has asked each member of the Board of Directors to determine three measurable objectives that they believe can be accomplished this year in their individual portfolios. Once the objectives are compiled, they will be compared to our strategic business plan and prioritized for implementation as circumstances and resources permit. All members-at-large are encouraged to submit their ideas to Jo for consideration at the next Board of Directors meeting on April 7, 2001.

Although only three objectives were asked for, my personal list has six items that I would like the OAS to achieve. Some can be done rather quickly while others will take more than a year or even be a bit further beyond the horizon. It is important, nonetheless, to have long-range as well as short-range goals that take some effort. If it was easy, everyone would do it and there would be no challenge. That's part of the fun in working with a great organization like the OAS. Challenges are not only stimulating but also so rewarding when they are mastered. And the OAS has the demonstrated ability to provide day-to-day services to existing members substantial value in excess of the fees charged as well as to develop diversified and innovative programming to attract new members.

- My first objective would be to greatly increase the OAS membership base in all categories - student, avocational, consulting, institutional and academic. This is important because our annual Provincial Heritage Organizations (PHO) operating grant from the Ontario Ministry of Citizenship, Culture and Recreation (OMCzCR) is dependent upon the OAS continuing to demonstrate broad representation with community ori-

...more web links

It seems once we start looking for Archaeology Education based web links, they start appearing everywhere!

The two that I'm posting here, are from the U.S. The list lesson plans and related links for the K to 12 curriculum. I found them informative and easy to access.

www.mtsu.edu/~then/Archeology/index.html

<http://coloradodigital.coalliance.org/cfindex.html>

Introduction to Archaeology

Now something for our Avocationalists wishing for more archaeological fodder to chew on.

The OAS is presenting, at our Richmond Hill site, a nine week program beginning on Apr. 5, 2001, entitled *Introduction to Archaeology*.

This program has been designed to range over all points in archaeology, from why and how its done, through Classic and North American archaeology, to underwater archaeology.

Our membership is fortunate to have specialists that can present each segment with their own brand of information and experience.

So look for the registration form in this issue and get into the OAS office pronto!

ented Chapter activities across the province. This grant allows the OAS to have a half-time staff position (the other half is funded by our revenue generating programs). Although thanks

T E A C H E R ' S E D G E

to our friends in the OMCzCR, the grant was increased by about 3% this year, there is no guarantee that the PHO grant program will continue. The OAS must have more public events and partnering arrangements (not just regular day-to-day operations) to remain eligible while the program is still available. There is very stiff competition from eleven sister heritage organizations for a relatively small share of a decreasing pool of PHO funds.

- My second objective would be to institute a fund-raising campaign to develop OAS educational and capital construction programs. These funds are necessary in order to secure matching provincial and federal grants. As part of this objective, and as identified in the strategic business plan, the OAS should acquire a well-known public personality as a Patron to spearhead the campaign. Michael Johnson at the OMCzCR has indicated previously that the Ministry will assist in preparing a short list of potential candidates and provide any necessary letters of introduction. The Board of Directors would then interview the candidates before offering the position. Again, all members-at-large are encouraged to submit the names of appropriate individuals for consideration by the Board of Directors.
- My third objective would be to introduce the sale of high-quality reproduction Aboriginal and Euro-Canadian artifacts on the OAS web page. The Board of Directors last year recognized this as a means of reducing the ever-increasing demand for real artifacts from looted archaeological sites. Because there are a number of First Nation artists that already produce commercial reproductions, this would also be a ready means of building more bridges in partnership with more First Nation communities. Some artists are already making pottery vessels similar in size and shape and with designs and motifs obtained from actual vessels in archaeological collections. The examples I have seen are well worth the premium prices charged. If members know good sources of reproductions, please let the Board of Directors know.
- My fourth objective would be to establish an "Ontario Archaeological Hall of Fame" on the OAS web page. This would be relatively easy to do in "virtual reality" by simply digitally adding the citations and pictures all of our previous and future J. Norman Emerson Silver Medal winners as well as recipients of the Peggy Armstrong Public Archaeology Award (in consultation with the Ottawa Chapter), plus descriptions of seminal projects and publications that would be inducted. Should the opportunity arise in the future to partner with an appropriate museum/organization, and if sufficient funding is available for operation, an actual gallery could be established.
- My fifth objective would be to have the OAS and its newest partner, The Town of Richmond Hill, have a replica longhouse or similar Aboriginal structure constructed on municipal open parkland in back of our offices in the A.J. Clarke Interpretive Centre at the Elgin West Community Centre. Phased reconstruction on the MaGaw Iroquoian Village site might also be a long-term goal but it could not be done until security and archaeological concerns are satisfied. The proposed off-site structure would greatly facilitate OAS and other multi-purpose community programming involving outdoor activities during inclement weather. The structure could have a climate-controlled interior with an authentic appearing exterior built with modern materials requiring little or no annual maintenance. Because this project would entail major fund-raising in order to obtain matching provincial and federal grants, it should be more of a long-range goal unless, as sometimes happens, a target of opportunity to obtain sufficient funds appears unexpectedly.
- My sixth objective is with regards to self-regulation of archaeology in Ontario, and is one that might appear to be slightly controversial from reading recent and current Letters to the Editor in this and previous issues of Arch Notes. For the reasons I have stated therein, the OAS is a natural organization to provide the necessary leadership at this point in time although, at present, there are some naysayers who disagree.

Nonetheless, because self-regulation is of concern to all segments of the archaeological community (avocational, consulting and academic), it would be best to start by defining what it actually means and what its parameters of administration should be. Subsequent discussions at well-organized face-to-face meetings could then focus on reviewing supporting documentation and how to implement it.

At this point, all that is really suggested—in very broad brush strokes -- is that the OAS host at least one full-day meeting to be organized by an experienced moderator/facilitator where all interested parties can attend and voice their opinions on strategic agenda topics. Because not every relevant topic could be covered in one day, additional meetings should be hosted by other organizations on a rotating basis especially if this helps eliminate the false perception that the OAS would end up being the “regulatory body”. It is only proposed that the OAS partner with other organizations in order to facilitate setting up such a body in consultation with and approval from the OMCzCR.

Because such meetings will take some time to organize and to assimilate previous results, this proposed consultative process might take as long as two years or more to complete. It most definitely will not happen quickly nor will it ever attain a 100% consensus of approval before implementation or even after. Historically, self-regulation in other disciplines was never achieved without different opinions from practitioners and government on how and who to do it. The most important thing right now is to just start talking about it in a proactive and constructively critical manner. Because the process has to start somewhere, why not start by having a well-organized and focused group meeting without preconceived notions on what the end result should be or having concepts that are so entrenched in people’s psyche that it would be impossible to develop a broad consensus on what is best for the discipline.

With the start of 2001, three new members have joined the OAS Board of Directors. Along with the returning members Henry van Lieshout (Director of Finance), Eva MacDonald (Director of Publications)

and Tony Stapells (Director of Heritage Advocacy), I welcome Bud Parker (Director of Public Service), Frank Dieterman (Director of Member Services) and Charlton Carscallen (Director of Chapter Services). Because the Director of Marketing and Promotions position is currently unfilled, the Board of Directors is actively searching for someone to appoint to it. If a member would like to nominate someone or to volunteer for this position, please contact Jo Holden at our corporate office (905-787-9851).

It is always hard to say goodbye to members who retire from the Board of Directors. This year it is especially sad because the dedicated efforts and unselfish contributions of Hugh Daechsel, Vito Vaccarelli and Caroline Thériault will truly be missed. The list OAS 2000 Highlights in the previous issue of Arch Notes contains only a partial description of their accomplishments. Their camaraderie and spirited discussions at meetings and by e-mail always made Board work so much easier and enjoyable. On behalf of the new Board and the membership at large, I thank them and look forward to any opportunity of working with them again. Good luck to them on all their future endeavours. I’m sure that they have many more “contributions” to make, as we all do, to the OAS especially during the previously mentioned fund-raising campaign.

Bob Mayer, President

From the OAS office...

IN SO MANY WAYS this past year and thus far into this current year, exhaustion and excitement have gone hand in hand mainly because the Society has returned to its roots; a Society that provides the opportunity to its members to “dig”! Due to our partnership with the Parks, Recreation and Heritage Department of Richmond Hill The OAS is now the steward of the McGaw Site, a pre-contact Iroquoian village, circa 1400 to 1450 A. D.

There is lots of activity is in the making for this upcoming season and all it takes is YOU participating to make the Society’s dream come to reality! In this is-

sue of *Arch Notes* you will find "heads up" notices of the programs organized for this summer.

Just to get you thinking and planning what week you can participate in, please find the four one-week Adult Archaeology Camps/Vacation packages, two Day on a Dig opportunities (for those of you who can't manage a week) and a nine week Introduction to Archaeology course earlier in the spring. The nine week course utilizes the diverse expertise of our professional membership and will whet your appetite to get "dirty" this coming summer. *Please pay attention to the registration deadline dates on the inserts.*

Future programs and courses will be directed by user interest. If there is an area of archaeology that a group of people want a course built around, we have the talent, the facility, the site and the will to create it. So don't let us down, help The OAS develop an avocational archaeological program that rates with the best currently being offered in North America.

For those of you who do not live in the GTA, the Introduction to Archaeology course is the type that can definitely "go on the road". If there is a Chapter

President out there who would like to see this come to their community, please call and we'll work it out! Meanwhile there is the monthly lecture series at the centre too:

- Feb. 7 Norma Knowlton
Digging Costa Rica
- March 7 Ron Williamson
Iroquoians at the Head Waters
- April 4 Ellen Blaubergs
The Phoenix Site

If you hadn't registered, there is still time. Just call the office and I will take care of it!

And before I sign off for this issue, let me welcome our new Directors onto the Board, Charlton Carscallen, Bud Parker and Frank Dieterman (did we clone this man!). I am looking forward to working with these three fresh faces. I must also say so long to departing Board members, Vito Vaccarelli, Hugh Daechsel and Caroline Thériault. They worked very hard for us over the past four years and they are all ready for a rest and to explore new areas in their personal and professional lives.

Jo Holden, Executive Director

The Ontario Archaeological Society and the Town of Richmond Hill Parks, Recreation and Culture Department present
6th Annual



ARCHAEOLOGY UNEARTHED

*A day long workshop for budding and wannabe archaeologists
or those just curious as to how its done...*

SATURDAY, FEBRUARY 17, 2001 8:30 a.m. to 4:30 p.m.
Elgin West Community Centre, 11099 Bathurst Street, Richmond Hill, ON L4C 0N2
\$55.00 Adults \$45.00 Students and Seniors (bring your own lunch)

Note: Programme best suited for ages 10 to adult

LEARN HOW TO:

- make stone tools
 - date pottery
- analyse animal bones
- recreate ancient environments from seeds

For information and registration please contact the OAS office
toll-free: 1-888-733-0042
local calls: 905-787-9851
email: oas@globalserve.net

NOTE: The last day to register is February 14, 2001



FIRST CALL FOR PAPERS:

THE 2001 ONTARIO ARCHAEOLOGICAL SOCIETY ANNUAL MEETING HAMILTON, ONTARIO

The Ontario Archaeological Society presents:



*The Archaeology of Space & Place:
New Models in Great Lakes Archaeology*

**October 12th-14th, 2001
at the Ramada Plaza Hotel
Hamilton, Ontario, Canada**

The 2001 Conference, hosted by the Hamilton Chapter, requests abstracts around the theme of 'Space & Place'. Presentations are limited to a maximum of 30 minutes, and speakers should indicate their audiovisual requirements when submitting their abstracts. Topics suggested so far include, Spatial modeling and GIS; Ethnic identity and it's detection in the material record; Intra/inter-site modeling; Archaeological site prediction; Problems with Archaeological Master Plans; And Landscape Archaeology.

Ideas for Session Topics Welcome. If you wish to chair a session, please contact the Hamilton Chapter OAS. Send abstracts to:

*Conference Committee
Hamilton Chapter OAS
The Ontario Archaeological Society
452 Jackson Street West
Hamilton, Ontario L8P 1N4*

Email: hamiltonOAS@hwcn.org

Fax: (905) 525-4683

**Deadline for Abstracts, May 31, 2001
Deadline for Session Ideas, March 31, 2001**

OMCzCR Announcement

The Hon. Helen Johns, Minister of Citizenship, Culture and Recreation, has asked the OAS to participate in Ontario's volunteer recognition programs for the year 2001. Designated by the United Nations General Assembly as the International Year of Volunteers, 2001 will be a year-long world-wide celebration of volunteerism. This celebration will build on and reinforce the Ministry's plan to enable and recognize volunteers right here in Ontario.

Three award programs provide an opportunity to thank our volunteers and recognize them in a significant way. The programs are:

The Ontario Volunteer Service Awards that recognizes volunteers for continuous service with a community group.

The Outstanding Achievement Awards for Volunteerism in Ontario that recognize superlative volunteer work by individuals, groups or businesses.

The Ontario Medal for Young Volunteers that is presented to young volunteers between the ages of 15 and 24 years in recognition of their outstanding achievements.

If you would like to nominate an OAS volunteer for any of these awards, please contact Jo Holden (905-787-9851 or 888-733-0042) to obtain a copy of the nomination form.

The deadline for submission is March 2, 2001.

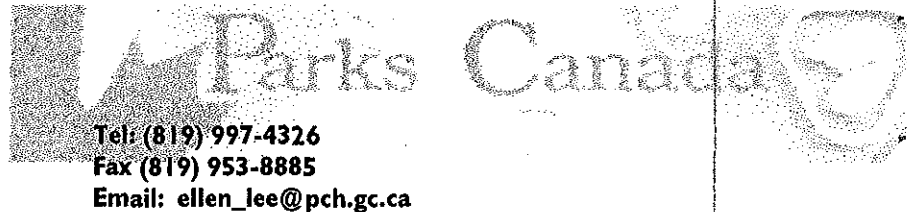
Parks Canada Announcement

The Archaeological Services Branch announces the official launching of the Archaeology at Parks Canada Web Page. The objective of the page is to inform Canadians of the work Parks Canada archaeologists do. In the future we hope to enhance the content the page to provide other archaeologists and a larger public with more material that could be helpful to them.

If you have any comments or feel that some things are missing, let us know and we will try to accommodate your wills.

You will find the page at the following address: http://parksCanada.pch.gc.ca/arch/main_e.htm

Ellen Lee, Director
Archaeological Services Branch
National Historic Sites
Parks Canada Agency
25 rue Eddy, 6e étage 25-6-W Pièce 173
Hull, Québec K1A 0M5



Tel: (819) 997-4326
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Email: ellen_lee@pch.gc.ca



Toronto Chapter MONTHLY MEETINGS

February 21, 2001
Ms. Helen Devereux

*Fieldwork
in the
Phifties*

Carrying on from her discussion of the "Fifties Phenomenon," Ms. Devereux will share her extensive first-hand knowledge of some of the major excavations that took place in Ontario in the 1950s, including the Warminster, Benson and Mackenzie sites. Not only were these among the first in which OAS members were involved, the excavations also contributed to the first regional chronologies formulated for Ontario by Dr. Emerson and others.

The Ontario Archaeological Society carried out excavations during the 1960s at the Beeton Site, BaGw-1, a fortified early-contact period village. In this talk, Dr. Latta will describe the Beeton Site and its special role in the early contact period. She will also talk about the early history of the OAS, reflected in one of its most sustained field programs, and contributions of current members of the Toronto chapter.

March 21, 2001

Dr. Marti Latta, University of Toronto

*The Beeton Site
Gateway to Huronia*

NOTE: Meetings begin at 7:30 PM and will be held in Room 561A, Sidney Smith Hall, 100 St. George Street, on the U. of T. campus, so that members will have an opportunity to view the "Partners in the Past" exhibit.

O A S E G Y P T T R I P D A T E S A N N O U N C E D

The departure date for the 2001 OAS trip to Egypt is set for Friday November 2. We shall fly direct non-stop to Cairo from Montreal Dorval. Connections to Montreal from Toronto and US commencement points will be provided. For Canadian members, this will avoid the previous hassles of changing airports at New York and going through US Customs & Immigration with luggage. This is a new service by Egypt Air. Toronto departure will be mid-afternoon, arrive Cairo 4.30 p.m. local time the next day, four hours shorter than any other carrier. Beside being the quickest way to Egypt there is the further advantage in the benefit when we fly from Cairo to Luxor/Aswan, as we shall not be using the train this time. Return flights from Cairo are Mondays overnight, or Fridays, depart Cairo 9.00 a.m., arrive Montreal Dorval 5.20 p.m. the same day for transfer to flight for local destinations. Those returning after the two week basic package will depart Cairo Friday November 16, a one-week extension Friday November 23 etc. The itinerary for the main two-week package, and a variety of 3, 7, 10, 14, etc. day extensions is in preparation and will be available shortly.

If you would like to receive information, contact Charles Garrad, 103 Anndale Drive, North York, ON M2N 2X3, tel: (416) 223-2752; email: charles.garrad@sympatico.ca - or the OAS office (905) 787-9851 or oas@globalserv.net - meanwhile, intended participants please make sure your contact details are current with Charles. Information recently sent to three email and one postal address was returned undeliverable. *Keep saving - and keep reading!*

Employment Opportunity

Archaeological Field Director
McGaw Site, Richmond Hill

Responsibilities:

- Supervision of assistants, volunteers and public programming participants in the controlled test excavation of an Iroquoian village; conducting preliminary background research and artifact analyses; preparation of a license report to the minimum standards required by regulations in the Ontario Heritage Act and job management tasks as assigned by OAS Executive Director or designate.

Minimum Qualifications:

- MA or higher degree preferred in Archaeology/Anthropology with at least three years field experience and completion of an archaeological field school. BA will be considered if applicant is currently in an archaeological field school. Applicants must have prior supervisory experience in the excavation of an Iroquoian village site, and preferably also have teaching experience.
- Excellent communication and computer skills.

Demonstrated:

- Knowledge of Aboriginal cultures in Southern Ontario.
- Ability to supervise a field crew during archaeological excavation, including the ability to establish and maintain an excavation grid using a transit.
- Ability to sort and conduct basic analysis of Aboriginal artifacts.
- To manage archaeological projects from start to end, including the ability to maintain schedules and manage project budgets.
- Up to date CPR and First Aid skills.

Salary:

- \$1000.00/week (35 hour week).

Send resume with references to:

Jo Holden, Executive Director
Ontario Archaeological Society
11099 Bathurst Street
Richmond Hill ON L4C 0N2

Deadline: March 15, 2001

Only those selected for an interview will be contacted.
We thank all applicants for their interest.

Your Home ...

EVERY YEAR, we accumulate more and more "stuff"... some with great monetary value, others with great sentimental value. Each room in our homes becomes a testament to the lives we've lived and the memories we've accumulated.

But what if you lost everything in your house? Would you be able to list each and every one of your belongings from memory? Would you know exactly how your grandmother's ring looked so it could be reconstructed?

We don't often think about these things until it's too late, or we don't realize just how much we've actually accumulated over the years. For these reasons, it's so important to get a true representation of what we have in our homes.

Each year, take the time to list your belongings, room by room. List the date purchased, the purchase price, the serial number, and the replacement cost. Make a video. If you don't have a camcorder, borrow one from a friend or rent one from your local video rental store. Take pictures. Open your cupboards, closets, etc. and take a picture of each wall in your home. Take the list, video, and/or the pictures, and any important purchase receipts and store them together in a safety deposit box or, if you have a personal workspace, a safe spot at work.

One of the most distressing things for people when they have a claim is determining what to do about items that are irreplaceable. This might be a tapestry or a quilt that you have hanging on your wall. To make things less frustrating at claim time, take a picture of that item and on the back of the picture write down any information you know about it. Even though the item cannot be replaced, your insurance company will provide you with money to compensate you for your loss.

Be aware that a standard Homeowners' Policy has special limitations on certain items. Talk with your broker and be familiar with these limitations. This will ensure that you and your broker know whether you need a rider on your policy to provide you with adequate coverage. For example, most policies have a limit of \$2,000 to \$3,000 for jewellery that's stolen. If you lose a piece of jewellery, it's not covered unless you have special coverage.

By itemizing your belongings, not only will you be ensuring that you have a listing of everything in your home, you may rediscover some forgotten memories along the way.

Article provided courtesy of Johnson Incorporated. For more information, contact your broker or Johnson Incorporated at the new toll-free number 1-800-563-0677.

... another Jim Pendergast article

Charlie Garrad has found a Jim Pendergast article he missed from the Bibliography in Arch Notes 5(5). For the record it is:

1995 "The Identity of Jaques Cartier's Stadaconans and Hochelagans: The Huron-Iroquois Option" (pp.106-118 in) 'Origins of the People of the Longhouse', Proceedings of the 21st Annual Symposium of The Ontario Archaeological Society October 1954, (eds. Andre Bekerman and Dr. Gary Warrick); Toronto: The Ontario Archaeological Society.

The Great Pyramid Revisited – 2001

by Henry van Lieshout

... ten years after first standing in front of the Great Pyramid,
I am no closer to understanding how this project was completed.
I comfort myself in the knowledge that I'm not the only one. ...

During 2001 the OAS is planning its fourth trip to Egypt, and I am sure that quite a number of travelers this time will be on their second, or even their third trip. A visit to Egypt is more than just another trip to an "exotic" place, for it has the ability to send an inquiring mind its own journey of discovery into the past. However, there is not unanimous agreement among members that such trips should be undertaken. One of our members, the late Ken Rouff, in responding to the questionnaire the OAS distributed at the time we were developing the 1994 Strategic Plan, had this to say about opposition to such trips:

"Egypt was singled out as one of the exotic locales visited by the OAS.
One should not have to apologize for this, for this is where it all began"
(Arch Notes Nov/Dec 1993:6)

I REMEMBER STANDING in front of the Great Pyramid, one of 42 fellow OAS members on the 1991 trip, when two thoughts crossed my mind. The first one was, "if the only technology, with which we credit the builders of these pyramids, are ropes and wooden levers and sleds to move and hoist these two and a half million stone blocks, then the pyramids could not possibly have been built". The second thought was that, "if indeed this was the only technology available to them, what would the logistics of building the pyramids have been like". Following the trip, I have read various publications on this topic, but not all of my questions have been answered, and these thoughts have therefore remained with me. From time to time, I have tried to quantify and understand the logistics of the construction, and so in the paragraphs that follow, I will share my thoughts

on this. But, first a word about the earliest recorded comment on how the pyramids were built.

Most of our early knowledge of the pyramids is handed down to us by the "Father of history", the Greek historian Herodotus, who traveled to Egypt in about 450 BCE. Upon enquiry, he was told that the Great Pyramid (also known as the pyramid of Cheops or Khufu) is the tomb of an ancient king, and that its construction took a workforce of 200,000 people 20 years to complete.

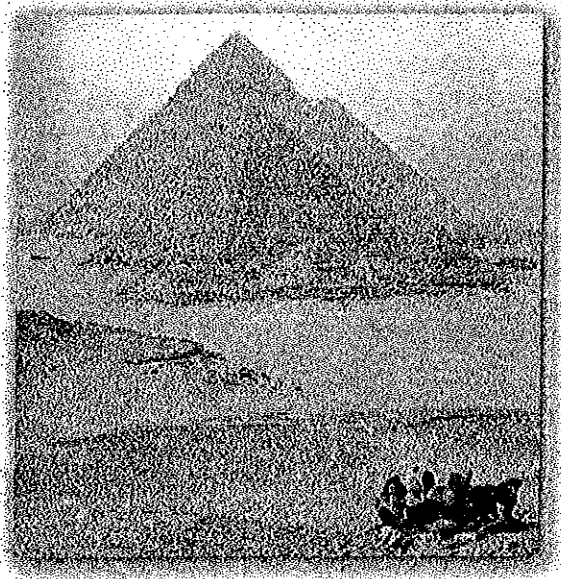
Just standing in front of the Great Pyramid, the most striking thing is the enormous quantity of stone in the structure. It's simply overwhelming. For me therefore, the first question that comes to mind in trying to visualize the enormity of the task, is the quantity of stone required. We are told that there are about 2.3 million blocks

of stone here. I wondered about how long it would take just to count to 2.3 million, at the rate of one number per second, during normal business hours of 8 hours per day. The answer is 16 weeks, just to sit and count to 2.3 million. At first I could not believe the answer, and so I recalculated it, and a third time, and again. Surely there's something wrong with my math, but no, 16 weeks is correct. I know what you, the reader is going to do now, you're going to check the math yourself – well try it. It's this calculation that set me off to make some more calculations, which are in the paragraphs that follow.

As mentioned, we are told that about 2.3 million sandstone blocks of an average of 2-3 tons each had to be quarried from the Moqattam Hills quarry, and that this quarry lay about 15 km away, but on the other side of the Nile.

This means that the stone would have been shipped across the fast flowing Nile to the Giza site, and in order to move 2.3 million blocks in 20 years, the production and shipping rate must have been 325 blocks per day, flood or no flood, every day for 20 years. If we assume that the Nile was not navigable for a month each year because of the flood, then the shipping rate across the Nile would have to be nearly 350 per day. Now, assuming a 12 hour workday, the rate of shipment out of the quarry, and across the Nile would have to be 30 blocks per hour, or one stone every two minutes. We have no way of knowing how many barges were constructed to work on the project, but given my math, it would mean that a barge had to leave the west bank every two minutes, for 12 hours per day, for 11 months per year, for 20 years.

The next logistical question is how many barges were used, and



where did the timber come from, given the fact that there was no suitable wood in Egypt. The barges were probably not large enough to hold too many blocks of stone, whose average weight was in the 2-3 ton range, so I'm assuming that a barge took only one block at a time. One further assumption is that a round trip for a barge took about 90 minutes (10 to load, 10 to offload, and about 35 minutes for each crossing), so that each barge could make eight round trips in a day. Based on these assumptions, it would take a fleet of 50 barges, covering a one km waterfront section of the Nile, and departing from the west bank at the rate of one every two minutes, for 20 years, to ship the material to the site. If these are reasonable assumptions, I can picture frantic human effort under way over 20 years. At the quarry, on the road-way from the quarry to the Nile, at both sides of the Nile where the loading and unloading of a constant tide of blocks of stone took place, and on the causeway leading to the elevated Giza plateau on which the construction was taking place.

Wherever we look, all we see are men at work with sleds, levers and rope, battling to meet the shipment quota of one block per two minutes. Some-

thing we need to remember, is that these stone blocks are not crudely carved items. They are precisely carved to fit closely together, yet evidence of the tools used has not yet been found.

Then there is the tougher question of the red granite blocks. About 10,000 of these blocks were quarried from the Aswan quarry for the inner passageways of the Great Pyramid, and its chambers. This quarry is about 8km from the Nile, and about 800km up-river from the Giza site. We are told that some of the granite blocks in the King's Chamber weigh from 20 to 70 tons, the latter being the equivalent of a locomotive, and on average each of these granite blocks is 20 times heavier than the sandstone blocks. As you can imagine, the logistics here are much more inspiring, because these blocks of granite first had to hauled to the Nile, then loaded onto much larger barges than used for the sandstone, floated down the river, unloaded and moved to the site.

Given their reported technology of ropes, sleds and wooden levers, I have difficulty with the notion of lifting a 20-70 ton piece of granite, gently placing it on a boat (with masts and sails in the way), floating it down river to be off-loaded in a similar way. There are some authors that suggest the workers loaded blocks in the dry season when boats were sitting on the desert sand, and waited for the flood to lift the loaded boats. If the impact of the flood lasted, say, 30 days, then wouldn't that reduce the work year at Giza drastically,

given that the inner passages and chambers that use this granite extend from about ground level up to half the height of the pyramid? This theory does not sit right with me, and I just can't get a good picture of how they managed the shipment of this granite, nor have I seen any credible explanation.



Here too, the granite blocks are not crudely carved. In the Grand Gallery and the King's chamber, the granite is smooth, and so tightly fitting, that you can't even get a razor blade in the joints.

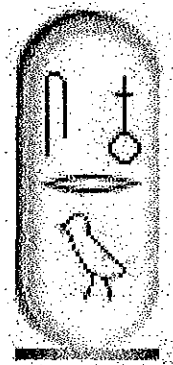
Now, let's explore the head-on ramp theory. Some authors assert that the ramp was only constructed of rubble and mud. However, the ramp at its height would have been at the pyramid's height, the equivalent of a 50 floor office tower. It would have to carry an enormous weight of stone blocks over a 20 year period, and it must have been constructed of more durable material than rubble and mud. The total weight that had to be dragged up the ramp was in excess of 6 million tons of stone. That's the equivalent of 250 cruise liners (of 25,000 tons each) that had to be hauled up the ramp, and rubble and mud doesn't work for me. Further-

more, it does rain in Egypt occasionally, and a ramp that was constructed with rubble and mud would have to be rebuilt from time to time, and this would result in fairly lengthy construction delays. Regardless of the material that was used, the addition of an enormous ramp has now doubled the scope of the construction project, which now consists of a ramp, and a pyramid. Various writers assert that the elevation of the ramp is one meter in height to 10 meters in length. If it were any steeper, it would be virtually impossible to drag the stone up the ramp, and because the pyramid is about 150 meters in height, the ramp must have been about 1.5 km long, and containing as much material as the pyramid itself would require. If this calculation is correct, the amount of material coming from the quarry would have to double, to the equivalent of 700 blocks of stone per day instead of the 350 mentioned earlier, and 100 barges would be required, covering a 2 km stretch of the Nile. Instead of a shipping rate of one block per two minutes, the shipping rate across the Nile would have to double to one per minute

What about the activity on the ramp itself. An estimate I have read suggests that a 70 ton block on a sled requires 900 people pulling the sled, and at four abreast, they would require a length of about 250m on the ramp. So far so good, because the ramp is 1,500 meters long, and there is ample space for the pullers, but there's a problem when the stone block is about 140 meters from

the top of the ramp. At the height where these 70 tonners have to be placed, the working surface on the top of the pyramid, now at half of its height, is only 110 meters square. There is just no more room for the 900 pullers to stand and do their pulling. If we are to believe what we are told, the 70 tonners would have traveled from their quarry in Aswan about 800 km away, only to be stuck at about 140 meters from the end of the ramp. At this point the granite blocks are 195 meters from their final destination, which is destined to be in the middle of the 110meter square pyramid platform.

I have not found any literature that addresses this problem. It's clear to me that we have a significant problem with the notion of pullers, rope and sleds, because most of the huge granite blocks that make up the Grand Gallery and the King's Chamber, could not have been pulled into position by the traditional method suggested.



There are some researchers that promote the theory that the ramp wrapped its upward way around the outside of the four sloping surfaces. This theory has been suggested as an alternative of the head-on ramp theory, but this ramp is not considered feasible because the casing stones would then have to be placed from the top down. The reason for this is that the finished surface of the pyramid was made up of a smooth sloping white marble casing blocks, and a wrapping ramp could not have been constructed on such a surface. Therefore, the ramp would have to be built on the unfinished stepped surface as it appears today, and then, as the ramp was demolished from the top down, the casing stones would have to be pushed into place. This is an unlikely method, because you can't get enough hands on to a 10-16 ton casing stone to push it into place. This type of ramp also means that 2.3 million blocks of stone would have to turn at each of the four corners, as they ascend up the ramp.

I have seen a TV program in which it was demonstrated that one ton blocks could turn a corner with some difficulty, but the demo did not show, nor explain how the 20-70 ton blocks were turned. Also, it took the demonstrators nearly five minutes to turn one corner, and as we have seen, the rate of construction needs to be at the rate of one block every two minutes in order to complete the task in 20 years. The wrapped ramp therefore seems improbable.

Before we move on, there's another problem with the ramp. Because the pyramid has 203 courses, the ramp height had to be increased about 200 times, as it grew in length to 1.5km over the 20 years of construction. Every time its height had to be adjusted, the rate of movement of blocks up the ramp would come to a standstill. If the volume of stone in the ramp were about the same as the volume of stone in the pyramid, then the amount of time available to move stone up the ramp would be cut in half to 10 years, the other 10 years being used to raise the ramp. This means that in order to position 2.3 million stones in 10 years, the rate of stone moving up the ramp to the pyramid would have to double to one stone per minute, instead of the one stone per two minutes mentioned before.

However, the rate of production from the quarry would likely remain at one block per two minutes, so that there would be some synchronization between the rate of production of materials at the quarry, and the rate of usage at the construction site.

As already mentioned, there are three types of stone used to construct the pyramid, sandstone, red granite and white marble, but to make matters even more complex, the courses are not all of equal thickness, and the height can vary greatly from level to level. So, for example, the height of course 34 is 66cm (2 ft), while course 35 is double that height at 130cm (4.2 ft).

The task for the materials planners is now becoming very complex. Different quantities of stone (depending on the ever-shrinking surface area of a course), of different types (granite, marble or limestone), and size (dependent on the course height) would have to be stockpiled at different points of entry onto the ramp as it lengthened to 1.5 km over time. There weren't any Pentiums around at that time to help with the planning.

Now, on to the next logistics problem. It is recorded that the sleds and roadways were made of wood, and that by pouring oil on to the wooden roadway beams, the pulling would be reasonably easy. Nevertheless, the sled runners, and the roadway, would experience a tremendous amount of wear and tear as the continuous hauling took place. Assuming the one sled would last for 10 blocks to be transported over the 15km distance from the quarry to the site, this required sled building at the rate of 40 new sleds each day, for 20 years. This woodworking activity took place in a country where there is no available hard wood, and where the closest source of hard wood was Lebanon. This means that the wood had to be shipped along the West Coast of the Mediterranean Sea, and then transported through the marshy Nile delta area to the Giza site. This is a long supply chain, which placed a huge demand on the sustainability of the wood supply. Given the fact that the Lebanese cedar is now extinct, it's more than likely that the pyramid

builders helped to push this hardwood into extinction.

We now come to the worst logistics problem of all. So far, and for the most part, the issues are individual activities that can be discussed independently. This new problem concerns management, planning and communication. Before a single stone moved up the ramp to start a new course, the traffic coordinator at the bottom of the ramp had to know precisely the order in which stones had to move. Otherwise the guys at the top would end up with blocks that they were unable to put in the right place as they came up the ramp. This would result in the creation of a stockpile of stones that were shipped out of sequence. As the pyramid increased in height, an undisciplined shipment up the ramp would make this problem more and more serious, because the available working area would get smaller and smaller, until the out-of-sequence blocks could be moved into position. This would mean that these out-of-sequence stockpiled stones would have to be moved twice, and this would slow down the whole project. What made it even more difficult is the fact that the red granite re-

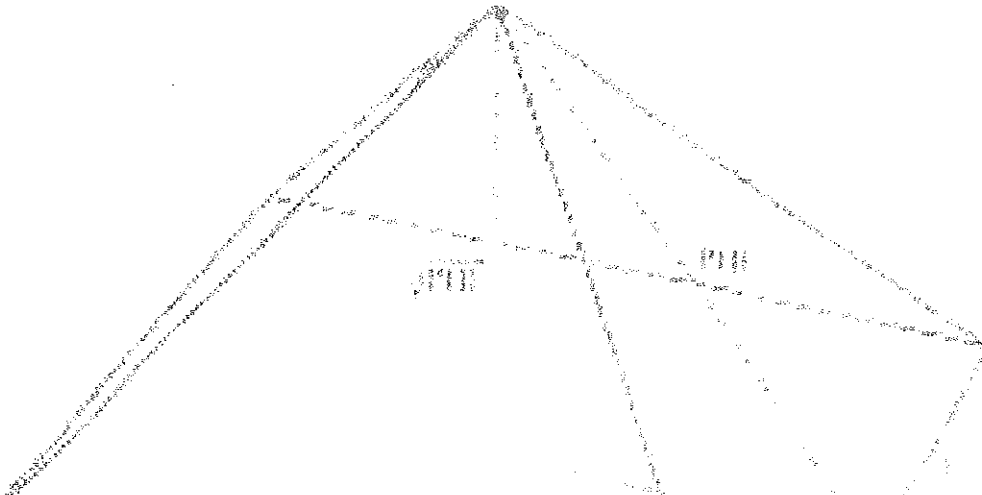
quirement was different for each of the first 120 courses because the internal chambers and passageways would change as the height of the pyramid increase with each course. The materials planners would need to be highly skilled in math to be able to figure out which stones were required when. There must have been a tremendous co-ordination of effort to ensure that the correct material moved up the ramp in the sequence that would permit the placement of a 2 ton, or a 70 ton, block at the average rate of one block per minute. Therefore, the traffic coordinator at the bottom of the ever-lengthening ramp had to know precisely where to stockpile the constant flow of three types, and sizes, of stone. Each course had to have the correct quantity, size, and type lined up ready to move as soon as the ramp was available. If the materials management folks didn't have this part of the project well under control, then the project would suffer from constant delays.

So, ten years after first standing in front of the Great Pyramid, I am no closer to understanding how this project was completed. I comfort myself in the knowledge, that I'm not the only one, for there is

no one else that has been able to table a credible answer either.

I intend to visit Egypt a second time with the OAS this year, and when I again stand in front of the pyramid I will be even more awed by what my eyes register. In 1991 I wondered what the logistics were like for those who planned, and built this structure, but this time I have some understanding of the types of logistics problems these ancient people had, based on my 21st century assumptions, and our 21st century beliefs about its construction. My mind tells me that it's impossible to have built this monument the way we are led to believe, yet it's here, taking in my entire field of vision.

We don't know what really happened here, and what the construction site really looked like about 4,500 years ago. The late Ken Rouff was a traveler on the OAS trip in 1991, and his words "*this is where it all began*" are now part of our OAS archive. The question for me is, "*if this is really where it all began 4,500 years ago, when will we know the answer to the questions regarding its construction*".



We're not the only ones...

[The following is a small selection from www.innerx.net/personal/tsmith/Gpyr.html
there are many, many more sites...]

The Great Golden Pyramid has height square root (PHI) = 1.272... and base $1+1 = 2$
Each triangular face intersects the ground at an angle of $\arcsin(\text{square root (PHI)/PHI})$, a little less than 52°

Since $4/\sqrt{\text{PHI}} = \text{PI}$, approximately, the circumference of a circle whose radius is the height of the pyramid
is $2 \times \text{PI} \times \text{radius} = 2 \times \text{PI} \times \text{square root (PHI)} = 2 \times (4/\sqrt{\text{PHI}}) \times \text{square root (PHI)} = 2 \times 4 = 8$,
and since the perimeter of the base of the pyramid is $2 + 2 + 2 + 2 = 8$
the Great Golden Pyramid approximately squares the circle

Each face is an isosceles triangle of height PHI times the semibase.

Such an isosceles triangle has central angle $2 \arccos(\text{PHI}/\sqrt{1+\text{PHI}^2}) = 63.4^\circ$

If three such triangles are used to make a pyramid (instead of the four at Giza), and if they are mirrors to make a mirrorhouse, the result is an icosahedral kaleidoscope

Two small shafts go North and South from the Upper Chamber

The Northern shaft goes up at an angle of about 32 degrees to exit the pyramid at the 101st course.

If you looked out the Northern shaft, you would see the area of the North polar sky

If you went outside the pyramid and looked down the shaft, and could see through the pyramid and the Earth, you would see the area of the South polar sky

The Southern shaft goes up at an angle of about 45 degrees to exit the pyramid at the 102nd course

If you went outside the pyramid and looked down the shaft, and could see through the pyramid and the Earth, then (at a certain time of day) you would see the Center of the Milky Way galaxy in Sagittarius

If you looked out the Southern shaft from within, then (at the same certain time of day) you would see the thinnest part of the Milky Way, North of Betelgeuse, between Orion and Taurus

Obituary

Richard Stockton "Scotty" MacNeish

April 29, 1918 - January 16, 2001

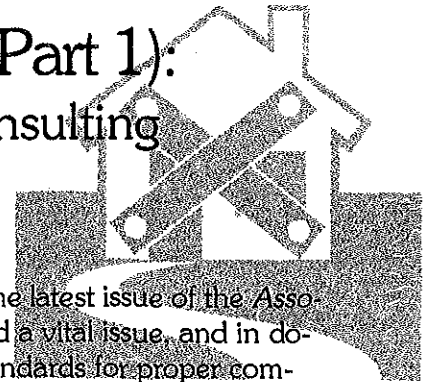
Dr. Richard Stockton "Scotty" MacNeish died in a hospital in Belize City from complications resulting from an auto accident. Scotty had been on a working vacation driving between the sites of Lamanai and Caracol. Fortunately British troops were nearby and were able to get Scotty and his traveling companion, long time friend and editor Jane Libby, removed from the wreckage and off to the hospital. Jane later recounted that the driver happened to be an archaeologist and that Scotty talked shop with him all the way to the hospital. Sadly, four hours later, Scotty passed away due to complications from the accident.

In Ontario Dr. MacNeish is best known for his epic work "Iroquois Pottery Types". While his conclusions concerning the prehistoric evolution of the Iroquois have been subsequently refined, the ceramic typology he established in the process is an established research tool in Ontario.

[Editor's request: a personal memorial of Scotty MacNeish would be welcome from the readers of AN]

Don't Bet the House and Farm (Part 1): Some thoughts on archaeological consulting

by J. Trevor Hawkins and Bob Mayer



BULLY FOR PAUL LENNOX! In his "Find the Cost of Survey" article in the latest issue of the *Association of Professional Archaeologists Newsletter* (Fall 2000), he has raised a vital issue, and in doing so, he has hit the 'nail' on the head. We do need to know the industry standards for proper competitive bidding, for anything else places the 'professional archaeologist' in a difficult, if not impossible, position. Underbidding may secure the contract, but it introduces a very serious risk of default under the contract for which the 'professional archaeologist' is legally responsible. In this sense, Lennox asks a very important question "is the house in your name?" To remain both competitive and viable in this business, it is essential that all costs be calculated accurately.

But Lennox introduces a non-sequiter when he says "so, let's say for easy figuring 10 holes an hour" He then calculates the cost using an arbitrary hourly rate of pay, and assumes that the archaeologist can excavate one test pit every six minutes for ten hours, four days a week. Two dollars per test pit would seem to be a bargain. However, Lennox quite rightly points out that the 'professional archaeologist' has additional expenses, such as living expenses, that must be factored in. He has calculated these in his example to be \$100.00 per day. For the 400 test pits excavated during the 40-hour week, the cost would be \$1,200.00 (not the \$1,000.00 Lennox suggests), bringing the average cost of each of the 400 test pits dug during the week to \$3.00. At this price, will Lennox's 'professional archaeologist' save his house? Or, has the professional archaeologist in fact bet (and perhaps lost) the house as well as the farm?

When Lennox points out that there are additional expenses beyond the direct basic labour cost, he has again hit the 'nail' on the head. But the professional archaeologist must recognize that there are many more nails to be hit than the ones Lennox describes. And each of these affects the project cost and must be accounted for in a viable bid. It should be understood at the outset that academic archaeological research and cultural resource management are different, albeit related, disciplines. The academic research focus is to acquire knowledge. The cultural resource management (CRM) focus is to document the minimum basic knowledge required such that development can proceed in a timely manner. As well, the business foci are different. Academic research is funded in advance and without financial investment by, or risk to, the principal investigator. And handily, all of the bureaucratic/administrative overhead labour and costs are supplied by the academic institution. They seldom are of concern to the professional archaeologist who serves as the principal investigator. In similar fashion, a professional archaeologist who is employed as a civil/public servant has the support of the whole of the governmental bureaucratic/administrative staff and facility. And although he is involved as a professional archaeologist in a CRM capacity, he/she is not required to have any advanced financial expertise. As Lennox said "Forty hours, four hundred holes: simple".

It is not this simple, however, for the self-employed CRM professional archaeologist who 'bets the farm' with every proposal budget. For this CRM professional archaeologist there are many more nails to hit upon the head. Every single task performed by the administrative bureaucracy supporting the academic and government professional archaeologist must be performed by the consultant CRM archaeologist and paid for from the proceeds of the project. These costs cover a wide range and some, such as down

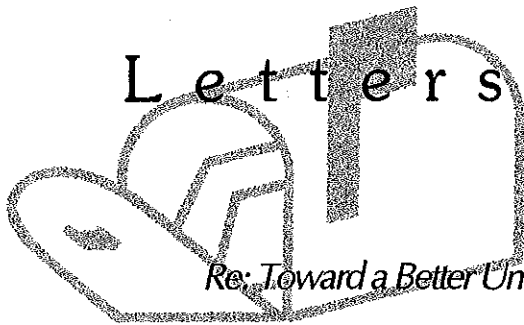
time, holiday pay, employment insurance and health premiums, Canada/Quebec Pension Plan contributions must be paid as required by law. Other costs such as the many forms of insurance, office overhead, and employee supervision required also add to the per hole cost. The list to be considered in costing out a project is immense and the CRM professional archaeologist just starting out in consulting probably has received virtually no training in factoring these business operating costs.

While Lennox has 'hit the nail on the head' in his efforts to establish credible industry standards, the CRM professional archaeologist would do well to modify his statement to read "forty hours, maybe four hundred holes: not so simple after all." To do otherwise, one risks missing the nail head, with the result that not only is the thumb smashed but the house as well as the whole farm could be lost.

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Letters to Arch Notes

Point-counterpoint

Re: Toward a Better Understanding about Proposed Archaeological Self-Regulation

CONCERNING THE TWO letters to the editor from Tom Arnold and Lawrence Jackson in the previous issue of *Arch Notes*, there are a few points that I would like to expand upon in an effort to arrive ultimately at a majority consensus.

THE UNDERLYING PRINCIPLE of self-regulation is not to control or to limit anyone's access to avocational activities, to the practice of archaeological consulting or to academic research but to ensure the efficacy of the discipline as well as the appropriate delivery of value for services rendered under all licence categories. Self-regulation cannot direct nor dictate academic research because each university's ethics committee already regulates that aspect through existing mandates. Similarly, it cannot direct or dictate the level of fieldwork or analytical research in a consultant's mitigative excavation

report because each individual development project (either private or public) can only afford a finite amount of time and cost before it either cripples the project or makes it financially not viable. It can, however, provide some basic guidelines within which consultants can operate and provide an official appeal procedure that is currently lacking under the existing system.

WITH REGARD TO Arnold's suggestion that we follow the British Columbia example in setting up a self-regulating industry, is it mandatory that Ontario follow another province's approach without exception? The situation and circumstances here are certainly not the same as there. In Ontario it is the Ontario Archaeological Society (OAS) that has taken the initiative in its current strategic business plan to suggest that now is the time to consider self-regulation on a province wide basis for land and marine archae-

ology. Has any other organization done this? If so, has it solicited the opinion of its members on who should be involved and how to accomplish it? Although I am a member of many heritage and archaeological organizations, I am not aware of any that have or are in as influential a position as the OAS to actively facilitate the establishment of self-regulation in Ontario.

THROUGHOUT ITS 50 years of corporate experience, the OAS has demonstrated its considerable staying power, respectability, and success in providing a wide range of services and benefits to its members. Consider the OAS's accomplishments of recent years: i.e. the reestablishment of a full-time Executive Director position; its new corporate offices and unique partnership with the Town of Richmond Hill regarding the management of an important archaeological site; and its public outreach and education programs.

CONTRARY TO Jackson's suggestion that the OAS is comprised primarily of avocational members, the OAS is privileged and honoured to count among its 600+ members a greater sustained membership that includes more licenced professional cultural resource management (CRM) archaeologists, for instance, than any other archaeological organization in Canada, and certainly more than the Association of Professional Archaeologists (APA) on whose behalf he wrote his letter as President. Five of the seven members of OAS Board of Directors are professionals by either having archaeological consulting licences or by earning their livelihoods working full-time for CRM archaeological firms. The remaining two Directors are professionals with full-time careers in other disciplines, and who have organizational and management skills that complement and balance the archaeological qualifications and experience of the other Directors. The OAS also has about 50 dedicated volunteers from all walks of life serving on nine standing committees that report to the Board of Directors.

And it is the OAS refereed journal, Ontario Archaeology (the only such journal in Ontario), to which licenced CRM consultants and licenced academic researchers submit many of their research publications in order to fulfill in part their academic and grant funding obligations. In addition, many licenced CRM consultants routinely publish the results of their investigations and mitigative excavations in Arch Notes, the OAS bi-monthly newsletter. Jackson himself recently published in *Arch Notes* (2000 Volume 5:13-16) a review of a publication by Christopher Ellis and D. Brian Deller plus others on their investigation of an early Paleo-Indian site near Parkhill, Ontario. A recent trend has been for consultants to also publish in *Arch Notes* practical matters on business related strategies ranging from how to estimate the time required to perform various field assessment methods to the cost of purchasing/maintaining field vehicles. The monthly meetings of the seven regional Chapters of the OAS are well utilized by licenced academic researchers and licenced consultants to discharge their departmental and public service responsibilities. The OAS on-line mailing list, OAS-L, provides instant access to avocational, students, consultants and academics for solving particular research problems. No other archaeological organization in Ontario provides as much or as often such varied information of interest to all levels of archaeological practitioners and to the public at large as does the OAS.

GIVEN ITS long-standing commitment and its contributions to all aspects of archaeology, the OAS should neither abdicate nor abnegate its responsibility and ability to facilitate the drive toward self-regulation despite assertions to the contrary from those with opposing views. I cannot accept Jackson's placing a limitation on the OAS to having just an "educational role" when no other organization in Ontario can come even close to matching the contributions the OAS makes or the services it provides to professional and academic archaeologists.

HOWEVER, under the proposed model, it is not intended that the OAS be the "regulatory body" and perform the same licencing functions like the Archaeology Committee of the Ontario Heritage Foundation once did on behalf of the Ontario Ministry of Citizenship, Culture and Recreation (OMCzCR). Under existing or new legislation, a separate body, perhaps a Board or College of Archaeologists could be created using the facilities, corporate experience and leadership of the OAS to arrive at that stage. Although this proposed board would consist of archaeologists that are elected/appointed by licenced practitioners, it would be separate from and independent of the OAS and every other professional body. It would also operate at arm's length from the OMCzCR.

IN THIS MODEL, the OMCzCR would nonetheless retain a central function with respect to the accreditation/certification process inasmuch as it would be the Ministry under whose aegis the Board or College would be formed and on whose behalf the licencing process would be administered. Self-regulation would therefore have a statutory force-in-law over and above the current voluntary ethics and standards of practice that are exercised with little or no actual enforcement capability by the OAS or the APA. The OAS, as well as other organizations, would provide the necessary accreditation/certification courses and upgrading programs on a self-sustaining fee for service basis.

TO PURSUE this goal, Jackson is right in that "co-operation is the best course" and even necessary. No one has said otherwise. To this end, the OAS would welcome a joint approach with representation from First Nations, the land development industry and organizations in the

province with archaeological interests including the APA, Canadian Association of Professional Heritage Consultants, Canadian Archaeological Association, Save Ontario Shipwrecks, Ontario Underwater Council, among others. The OAS is planning to host at its new facilities an exploratory meeting(s) that would be led by an experienced moderator/facilitator to begin this process of reaching a broad consensus. I am quite sure that the OMCzCR and possibly the Red Tape Commission would be interested in participating. The OMCzCR might even be approached to provide the financial resources to hire the moderator/facilitator and to pay for other associated costs.

THROUGH SUCH meetings, the intention and the proposed process can be better appreciated so that Arnold's "reading between the lines" leading to erroneous and unsupported impressions can be avoided or precluded altogether. Arnold is nonetheless correct in believing that having a solid academic background is and would continue to be necessary for it is only through an understanding of the philosophy of archaeology that the discipline's responsibilities can be discharged. However, so that no one feels threatened by self-regulation, a "grandfather" clause should be established to prevent any established consulting licence holder from losing the means of earning a livelihood. Conditional licences would still be issued to avocational practioners and new consultants entering into the discipline who meet the existing criteria. Conditions would be removed through upgrading courses and/or additional experience.

Sincerely yours,
Bob Mayer

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James F. Pendergast

OA9

The Multi-Component Montgomery Lake Site
Barry M. Mitchell, P. Butler, J. Ford And J. Lance
 The Kaministikwia Intaglio Dog Effigy Mound
K. C. A. Dawson
 A Bibliography of Ontario Archaeology *W. A. Kenyon*
 Isolated Copper Artifacts from Northwestern Ontario
K. C. A. Dawson
 The Surma Site, Fort Erie, Ontario
J. N. Emerson And William C. Noble

OA10

A Comparison of St. Lawrence River Valley Iroquoian Sites
 with the Dawson Site *James F. Pendergast*
 Excavation with a Backhoe *Iain C. Walker*
 A Hillside Midden, King S Forest Park Site *William A. Fox*
 A Fluted Point from Collingwood Township, Ontario
C. Garrad
 The Excavation of Fort Plc, Ontario *Patricia L. Gall*
 The Borden Site designation scheme applied to Ontario
C. Garrad

OA11

Bones And Archaeology in Ontario *J. S. Cybulski*
 Analysis of the Skeletal Remains from the Surma Site, Fort
 Erie, Ontario *J.S. Cybulski*
 Pedology as a Tool in Archaeological Investigations
I. M. Fenwick
 A New Location for Carhagouha, Recollet Mission In
 Huronia *C.E. Heidenreich*
 "Vision Pits", Cairns and Petroglyphs at Rock Lake,
 Algonquin Provincial Park, Ontario *W.C. Noble*
 Type and Attribute Analysis: Their Application to Iroquois
 Culture History *J. V. Wright*

OA12

Archaeological Investigations at the site of the Longlac
 Historic Trading Post, Thunder Bay District Ontario
Kenneth C.A. Dawson

OA13

Iron Trade Knives on Historic Petun Sites *C. Garrad*
 Some Social Implications of the Iroquois "In Situ" Theory
W.C. Noble
 The MacDougald Site *J.F. Pendergast*
 Bear Jaw Tools from Petun Sites *C. Garrad*



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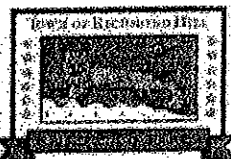
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