



ARCH NOTES

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September 1976

76-7

September General Meeting

The first Fall 1976 general meeting will be held at 8:00 p.m. on Wednesday, September 15 in the lecture theatre of the McLaughlin Planetarium, Royal Ontario Museum, Queen's Park, Toronto. All members and guests are welcome.

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Ontario Archaeology - call for papers

An annual call for papers is being made by the Editor of our scientific journal "Ontario Archaeology". All manuscripts and enquiries concerning publication, should be sent to: Dr. W.M. Hurley, Dept. of Anthropology, University of Toronto, 100 St. George Street, Toronto, Ontario M5S 1A6. Papers presented at our 1976 Symposium in October will be included in an upcoming edition of "Ontario Archaeology" if submitted to the Editor by November 15, 1976.

Hang It!

Use the front cover as a poster please - put it up on a bulletin board in your office, local library, or any other noticeable spot.

Newsletter of

The Ontario Archaeological Society (Inc.)

P.O. Box 241, Postal Station P, Toronto, Ontario, M5S 2S8

O.A.S. SYMPOSIUM 1976

The Ontario Archaeological Society presents a symposium on THE PREHISTORY OF THE GREAT LAKES REGION, to be held on Saturday, October 16, 1976 in the Dominion Ballroom North of the Four Seasons Sheraton Hotel, 123 Queen St. W., Toronto.

There has been an excellent response to the call for papers and we are anticipating the presentation of about ten papers. These will cover a broad range of topics including: burial excavations and interpretation, site reports and survey results from several regions of Ontario, and the utilization of historic maps in site location. Everyone with an interest in Ontario archaeology should find these topics both useful and informative.

We will be able to accommodate a larger audience this year due to our new location but pre-registration is encouraged. The fee is \$5.00 for pre-registration and \$6.00 at the door. Please complete the form below and send with your cheque (made payable to the Ontario Archaeological Society) to "Symposium Pre-registration", P.O. Box 241, Postal Station P, Toronto Ontario M5S 2S8. There will be no additional notification made to those pre-registering. Simply come to the hotel on Saturday, October 16. Registration will begin at 8:15 a.m. outside the Dominion Ballroom North. The papers will commence at 9:00 a.m.

The Four Seasons Sheraton is located on the south-west corner of Bay and Queen Streets, just across from Toronto City Hall. The hotel is easily reached by subway (Queen Street stop) and the Bay Street bus. There is ample parking at the City Hall underground garage.

Following the symposium, the Society has arranged for a cash bar at the hotel. If anyone planning to attend the symposium wants accommodation at the hotel, or to book dinner for the Saturday evening, their telephone number is (416) 361-1000. Rooms cost about \$33.00 single and \$43.00 double.

PRE-REGISTRATION FORM

Symposium on the Prehistory of the Great Lakes Region
Saturday, October 16, 1976

Name: _____

Address: _____

City: _____ Province: _____ Code: _____

Registration(s) _____ at \$5.00 each Total enclosed: _____

(Registration at the door will be \$6.00)

Archaeological Round-Up #3

1. A Faunal Analyst's Studies
of Northern Habitats
2. Field Work in Nouveau Quebec

What have members been
doing this summer?
Please contact the
Editor

1. A Faunal Analyst's Studies of Northern Habitats

Dr. Howard Savage,
Faunal Osteology Lab, University of Toronto

A faunal analyst is only beginning his contribution to the study of an archaeological site when he or she identifies the species of an excavated bone specimen. Addition of its age, sex and other data when possible, is another step forward. The methods of its preparation as food are of equal interest. However, the surroundings in which its faunal owner lived, i.e. the habitat, are of greater value in understanding the environment in which the human occupants of an archaeological site lived during its period of use.

In this framework, a second summer with the Northern Yukon Research Programme under the direction of Dr. William Irving of the University of Toronto, in and around Old Crow and on the Arctic Coast at Tuktoyaktuk, was most useful and informative to myself. Our base camp at the archaeological site of Klo-kut on the Porcupine River was the common ground and mingling point for the archaeologists, botanists, geologists, Old Crow people, palaeontologists, surveyors and zoologists (in alphabetical order) of the programme. From Klo-kut, project members fanned out by river boat or by helicopters for periods from a few hours to a week or more, for distances from one to ninety miles, up or down river, to the adjacent Old Crow mountains or over the flats.

A great diversity of habitats for significant mammal, bird and fish species was thus spread out for inspection and study. Gradually sloping river banks with gravel, sand or mud beaches, and flanked by dense willow and alder growth, were found to be home for red-backed and northern voles, arctic ground squirrels, bank swallows, and white-fronted and Canada geese (in their flightless period). The wet tussocks, and muskeg of all degrees of wetness, with scattered spruce trees, supported shrews as well as voles. In the higher and denser underbrush were to be seen Alaska Moose and caribou; here too were the havens of willow ptarmigan. Upland tundra, covered with hummocks of lichens and mosses was the nesting place for whimbrels. Land-locked lakes, often fish-free, on the Old Crow flats were feeding places for arctic loons. On open tundra, as well as along river courses with sparse tree and underbrush growth, were grizzlies, usually with one or two cubs.

Many small but significant facets of mammal and bird behaviour were noted during close association and study of these species. First hand observations provided information, significant to a faunal analyst. Just as preparation of the skeleton of a species is by far the best method for becoming familiar with its various characters, so does observation of the living species in its native surroundings acquaint the faunal analyst with the habitat of its choosing, its food choices, and behavioural differences.

(more)

More specific data re the plant species of habitats was added by the botanists of the N.Y.R.P. Plant assemblages, characteristic of different habitats, were recognized. Similar assemblages may be inferred when fossil and present day mammal and bird species are found in the Old Crow Basin and associated with the same fossil and present day pollen and/or seeds.

The proximity of the Old Crow Basin to the Arctic Coast invited search for salvage skeletal material of marine species, under permit from the Government of the Northwest Territories. One highly educational venture into off-shore waters of the Beaufort Sea one evening and with the assistance of a staff member of the National Museums of Canada and an N.Y.R.P. field assistant, led to the discovery of a fourteen foot white whale, killed earlier that day by Eskimo whalers. Towing approximately 1000 lbs. of whale beside a twenty two foot boat with a 25 horse power engine through two miles of rough water to the nearest island was complicated by the whale running aground in shallow water, until floated off by high tide. During four hours of skeletal preparation in cold salt water, Eskimo hospitality was provided by coffee, tea, biscuits and muktuk, and was greatly appreciated. Examination of midden material of archaeological sites on the Canadian Arctic and East Coasts will now be facilitated in the Faunal Osteology Lab. of U. of T.

In summary, habitat studies of present day and fossil vertebrate species in northern Canada can only be done by intensive field work, and when aided by botanical expertise.

2. Field Work in Nouveau Quebec

by Dr. John H. McAndrews

For the past two summers I have joined the Mushuau Nipi archaeological project led by Gilles Samson of Laval University. The study area is along the George River at Indian House Lake, located 155 miles northeast of Schefferville. The principal archaeological site contains an impressive 105 tent rings dating from historic Indian occupation and also a prehistoric lithic component. This site together with other smaller sites around the lake appear to represent seasonal caribou hunting camps.

Several specialists in ethnology, ecology, and geomorphology participate in this multidisciplinary project. My role is to reconstruct the vegetation and climatic history by means of pollen analysis of lake sediments. In 1975 I spent a week examining the vegetation of this part of the forest-tundra ecotone. We lifted a sediment core from a pond that we christened "Lac Roches Moutonee" after a nearby glacier-sculpted landform. Last winter radiocarbon dating as well as pollen analysis was done on the core. The lowermost organic pond sediment dated at 4,100 years ago and marked the draining of a high elevation proglacial lake. Because all known archaeological sites are below the pond, human occupation in the area must post-date 4,100 years. The pollen analysis indicated at first a lush shrub tundra followed by the migration of spruce and tamarack. These trees formed extensive stands by 3,000 years ago. Following this, and probably due to climatic cooling, forest stands shrank and tundra expanded; the vegetation seems not to have changed in the past 2,000 years.

(more)

This summer increased excavation of the prehistoric component yielded a variety of tools and waste flakes fashioned from both local and exotic raw material. For pollen analysis we chose to core several lakes on the plateau above the level of proglacial lakes hoping to get a record of the last 8,000 to 10,000 years. Fate did not co-operate - it rained and the bush plane was weathered in; the outboard motor got smashed on a rock, and a winter of exercise at the microscope made for slow hiking. The one plateau pond we tested had no sediment - only rocks. However, we did core two ponds at lower elevations and this year we named them not after geomorphic features but after our women archaeologists. Perhaps in a year I can tell you about the results from "Lac Emilie" and "Lac Martyne".

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O.A.S. Ottawa Chapter

The Ottawa Chapter now has a new executive for the 1976-77 season, as follows:

| | |
|---------------------|---------------------|
| President | David L. Keenlyside |
| Vice-President | Glenna Reid |
| Secretary-Treasurer | Iain C. Walker |
| Past President | Gordon D. Watson |

The newsletter of the Chapter also receives a new name with the September issue. "Archaic Notes" has now become "THE OTTAWA ARCHAEOLOGIST".

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STOP PRESS

Royal Society Symposium

The Royal Society of Canada announces a Symposium "New Perspectives in Canadian Archaeology" to be held at the Royal Ontario Museum on October 22 and 23, 1976. The symposium will consider the state of archaeology as a discipline in Canada with reports on Canadian involvement at home and abroad, the role of native peoples in the study of their own past, the new influence of governments at all levels, the problems of staffing and financing, the contributions made by archaeology to historical studies and the sciences as well as to the history of art, and to many other factors affecting the interest in and development of archaeology in Canada. Some twenty-five Canadians are delivering papers and three guests from abroad - Carl-Axel Moberg of the University of Göteborg, Michael Coe of Yale, and Graham Clark of Peterhouse, Cambridge - will guarantee that developments and points of view outside of Canada receive attention. Brochures containing the full programme will be mailed out early in September, but registrants may send their names and cheques for \$25 registration fee (before October 15; \$35 after October 15) to Miss L. Hoskins, Office of the Chief Archaeologist, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6.

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Peking Man, by Harry L. Shapiro (Allen & Unwin, London)

The poignant saga of how the Peking Man fossils were found and lost. The mystery of his possible survival today gives detective-story overtones to this taut anthropological drama.

Les Cahiers du Patrimoine - revised and corrected second edition of the work previously published under the title "Une station de peche iroquoienne a Pointe-aux-huissons (comte de Beauharnois, Quebec)" in 1974. Available from: L'Editeur officiel du Quebec, 1283 boul. Charest ouest, Quebec G1N 2C9. Price \$4.00.

New American Magazine

There's a new magazine just out called the "Amateur Archaeologist". It provides the layperson with informative articles on archaeology .. it provides a national outlet for amateurs and amateur organizations .. it's a means of guiding all amateurs towards a professional attitude. Here are a few of the articles presently being considered: The Compute and Archaeology, A Pictorial Essay of a First Dig, Basic Geology for the Amateur Archaeologist, How to Take Pictures of Stones & Bones & Points & Pieces, Working in the Archaeology Lab, Industrial Archaeology, A Basic Archaeology Library, Visiting Archaeological Sites, Understanding and Utilizing the Various Dating Techniques. Just send your name and address to: Wichita Publishing Company, P.O. Box 8012, Wichita, Kansas 67208, U.S.A., and they'll bill you. If you like what you see, send in your \$8.00 for a year's subscription, four big issues. If you don't like it, send nothing, but keep the first issue as a gift. If you prefer, send in \$7.50 with your subscription and save 50¢.

Na'pao - A Saskatchewan Anthropological Journal

The May 1976 edition of Na'pao covered a wide range of subjects. Of major interest to Ontarians is the first article, a discussion of the Craigleith skull, by Patrick Hartney, Charles Garrad and Howard Savage. Many members will be familiar with this skull, accidentally excavated near Craigleith in 1968 - the man with a hole in his head. Other articles are: Projectile point varieties from the Brockinton Site in southwestern Manitoba by James Patrick Whelan, The Hill Sites: two surface sites in the Swan Valley, Manitoba, by Eugene M. Gryba, Eskimos of West Hudson Bay 1619 - 1820, by David Meyer, and book reviews.

One issue will generally be published during each academic year by the Department of Anthropology and Archaeology of the University of Manitoba. Personal subscription is \$3.00, institutional \$4.00 a year, and some back issues are available. Write to: NAPA0, c/o Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon, Saskatchewan.

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ARCH NOTES is published 7-10 times a year by the Ontario Archaeological Society. All enquiries and contributions should be addressed to Mike Kirby, Chairman, Arch Notes Committee, 29 Tournament Drive, Willowdale, Ont. M2P 1K1.

In the October issue ... "The Crisis in Canadian Salvage Archaeology" ... "A New Look at Champlain's First Encounter With The Hurons" ...

Ancient Spores

Bacteria almost 2,000 years old have been rediscovered and precisely dated during excavations of first century AD buildings close to the ancient Roman fort of Vindolanda, in Northumberland, England. Similar bacterial spores have been recovered before from lake mud and estimated to be more than 1,000 years old; but the material from Vindolanda can be precisely dated from the objects found with it to AD 85-125.

It was preserved in layers of bracken, straw, leaves, twigs, feathers and dung which were trapped between the compacted clay floors of various periods. Rising water levels, and chemicals from the natural matter, preserved boots, shoes and other man-made goods along with the bacteria to allow exact dating. Now Vindolanda evidence may offer a new tool for archaeological analysis of material from the earth, to go with already familiar carbon-testing methods.

(Seward, Cross, Unsworth in Nature, Vol. 261, No. 5559.)

Voice From the Past

Thirty thousand years ago primitive man, whatever language he used, spoke with a rather nasal accent. Anthropologist Dr. David Burr has just completed a study of the skeletal structure of the mouths of Neandertal skulls and from which he has attempted to draw conclusions about their "soft structure" (tongue and throat) which perish much faster than bones. Dr. Burr concludes that in most respects Neandertal man had a mouth very similar to modern man, certainly large enough to allow speech and a fairly full range of vowel sounds. The only consistent differences he notes are that primitive man would have had a longer and narrower tongue than we have today and a more sloping palate. This, he says, would have given the sounds produced a constricted quality; early man would have sounded as though he had a permanent cold.

(Man, Journal of the Royal Anthropological Institute, Vol. 2, p. 104.)

Six Chapters of Canada's Prehistory

by J.V. Wright

National Museum of Man, National Museums of Canada, Ottawa, 1976

O.A.S. past-President Dr. James V. Wright is the author of a newly-released publication written for the general public and now available through the National Museum bookstore and the Information Canada outlets.

The work features six themes - the prehistoric Hunter, Fisherman, Farmer, Toolmaker, Trader and Houses, and embraces both Inuit and Indians coast-to-coast, as befits a product of the federal government. "One is made to realise how parochial most of our thinking and attitudes are when presented with comparative material unhampered by provincial boundaries or the limits of regional jurisdiction. The chapter on houses, for example, embraces the northern Algonkian winter and summer lodges, the Rocky Mountain Plateau pit house, the Plains tipi, the west coast plank houses, the Eskimo sealskin tent and houses of stone and whalebone as well as the Ontario Iroquois longhouse of more immediate familiarity. This approach is both enlarging and refreshing. The photographs and line drawings are impressive and as wide-ranging and varied as the topics. The general format, layout, typestyle and 9" x 9" size follow that previously established by Dr. Wright's 1972 "Ontario Prehistory".

C.G.

Rescue

In 1971, a group of British archaeologists and scholars in allied disciplines banded together to form "The Trust for British Archaeology". The group is popularly known as RESCUE and their object is to save sites from destruction by new fast radical excavation methods. RESCUE has devoted much of its efforts to informing the public about the crisis, marshalling the public and non-professional archaeologists to help in this quick rescue work. RESCUE has gone public with the message that meaningful future means the past must be rescued from the ravages of the present.

The RESCUE organization is really needed in Europe where the rate of site destruction is readily apparent. In Ontario, the government has enacted the Ontario Heritage Act (Bill 176) to regulate archaeological work and stem the tide of archaeological destruction in their Province. The Ontario Heritage Act incorporates two former pieces of legislation, namely the Archaeological and Historical Sites Protection Act and The Ontario Heritage Foundation Act, and bring the responsibilities for preservation under the wing of Robert Welch as Minister of Culture and Recreation and The Ontario Heritage Foundation chaired by former Ontario cabinet minister Bert Lawrence.

The Ontario Heritage Act is a lengthy legal document which spells out the involved property and expropriation laws that go into designating an historic site. The legislation, however, contains power to stop the destruction of a site under Section 62 called "Stop Order". Under this section The Minister can issue a 180-day stop work or destruction order while a site is examined or salvaged. The act also calls for a licencing system for all archaeological digs and provides stiff fines for those who dig without a permit. The act is, however, complex because of the nature of our property and land title laws; its proclamation is the easy part of the exercise.

It is more difficult to administer the act. The public can help by reporting finds, evidence of pot-hunting and illegal digs and other threats to historic monuments and archaeological sites to the Ontario Heritage Foundation.

The Act also calls for municipal councils to set up local Conservation Advisory Groups. Through these groups certain buildings and sites can be declared designated for preservation. (Further information and a copy of Bill 176 can be obtained from the Ontario Heritage Foundation, 77 Grenville Street, Queen's Park, Toronto.)

The decision of the federal Government to build the Pickering Airport raised more problems than were reported in the newspapers last year. As the "people or planes" debate ranged in the media, a quiet salvage archaeology dig was organized to excavate a large Iroquois village which was in the path of the first runway to be constructed.

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Known as the Draper Site, the dig was funded by the federal Government through the National Museum of Man for \$255,000. The site used new rescue techniques, which meant the use of machines to remove the topsoil and a staff of 65 people to do the excavation. Led by archaeologist William Finlayson of The University of Western Ontario the group lived at the site and worked in a field office which was once a two-room schoolhouse. The site proved to be much larger than expected (about 15 acres) and it was really the first time that rescue techniques have been employed on any scale in Canada.

Draper has proved to be very rich in stone tools, weapons, pottery, clay pipes, and, what is more important, large amounts of carbonized plant material which indicates that these sixteenth-century Iroquois farmers grew corn, squash and beans and supplemented their diet with wild elderberries, raspberries, blueberries, wild plums and cherries. There is also evidence at Draper of tobacco being cultivated and used by the Iroquois, which is the first evidence of tobacco in Ontario.

Since the end of the last digging season the finds have been examined at The University of Western Ontario. At the end of May funding for this work ended because of federal Government cutbacks and because the Pickering Airport has been postponed. Dig director William Finlayson has been looking for funds to carry on the work this summer - so far without success.

There may be a time in the future when the Draper Site at Pickering can be worked again. The question is, who really cares? Why should a government in time of economic restraints fund over a quarter of a million dollars to find out how sixteenth century Indians lived? Louis Brennan in his book "A Beginner's Guide to Archaeology" bluntly suggests that a contemporary society without a past simply does not have a solidly based future. One of the RESCUE advocates in Britain, Cecil Hogarth, argues that archaeological work is not just the labour of a few ivory-towered academics or the whims of quaint people with their minds lost in the past. Hogarth believes that the past is a vital part of our survival kit for this planet. The loss of our past, he maintains, is every bit as serious as the loss of the environment to pollution or the threat of an atomic holocaust.

If Hogarth is overstating the case in his last comment it is because the brutal truth is, we are losing our prehistoric heritage at an appalling rate. The fact that the rate of loss is not so appalling in Canada does not leave much room for complacency. Canadian sites are also endangered.

The world-wide preservation of the past is becoming a much more difficult task. It is ironic that as archaeological techniques improve and more scientific disciplines become involved in interpreting the past, the number of sites available to study comprehensively is declining. The past is not a renewable resource.

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Once destroyed or cavalierly treated, sites are gone forever. The sliver of history recorded in stone, on clay tablets, in papyrus scrolls, books and on computer programs is minute compared to man's occupation of the earth. Man or the progenitors of man have occupied this planet for almost three million years. Most of that history is still in the ground. It is prehistory, man's history before he could write. The destruction of this record beneath the ground could well be analogous to tearing down a library without removing the books. It is our history and our heritage that are at stake. In the face of contemporary times it appears that much of our history is about to disappear - forever.

Reprinted from
TV Ontario

Ancient Civilization in Bolivia

An ancient civilization rivalling those of Mexico and Peru existed in the tropical heartland of South America more than 1,000 years ago, archaeologists in La Paz believe.

Experts uncovering the first traces of the lost empire say it was centred on what is now northeastern Bolivia. Some 20,000 villages spread over an area of up to 200,000 square miles were linked by canals and raised embankments which served as roads.

The first hint that such a civilization existed came 10 years ago when oil prospectors in the tropical jungle reported finding geometrical patterns of waterways and apparently man-made mounds. The early findings were followed up by amateur archaeologist Ross Salmon and a Bolivian colleague, Dr. Victor Bustos. Salmon said in London earlier this month he believed the canals were used to control the floods which afflict the region for six months of the year, making farming impossible today. The Director of the Bolivian Institute of Archaeology, Dr. Carlos Ponce Sanjines, says the lost civilization probably declined toward 1,000 AD, but during its height had contact with other advanced people across the Andes and to the north in Colombia.

Ponce said investigations, still at an early stage, made clear the civilization had a large and advanced population. Its people used their network of canals for canoe transport as well as for irrigation, he said. "It's one of the richest discoveries in South America in recent times", he added.

Plans are being considered to excavate three villages which had already been located. Ancient roadways had been uncovered in a remarkable state of preservation. Stone axes used by the ancient people suggested they know of the Andes as they had been cut from Andean rock, he said.

It was previously believed that only the Inca people of Peru and Ecuador had attained any level of civilization in pre-Columbian times. If the Bolivian findings are correct, they show that the newly-found civilization predates that of the Incas.

Press Cuttings - cont'd

If the Shoe Fits

Usually presidential addresses tend to be dull. Not so the presidential address of Dr. James E. Bateman, president of the American Orthopedic Foot Society, and surgeon-in-chief of the hospital he founded, the Orthopedic and Arthritic Hospital, Toronto.

Dr. Bateman chose as his subject "The foot of the North American Indian" and it proved to be a well-documented, archaeological address. One would think it might be difficult to sustain much interest in the foot of the pre-Columbian North American Indian, even to an audience of foot experts, but Dr. Bateman did it easily.

The average North American Indian's foot was slightly smaller than the average white man's. The first metatarsal appeared to be shorted in relation to the femur. It had a longer, lower arch. The Indian was not flatfooted but his foot was adapted to carrying heavy loads.

The Indian's footwear was admirably suited to his life. The Eastern Indians used a soft moccasin while the Northern and Great Plains Indians used a hard soled type because of the rougher, stonier country he had to traverse. Yet there were as many kinds of moccasins as there were tribes. And it was said that an Indian's tribal affiliation could be told from his tracks, just from the cut of his moccasin. The North American Indian did know about making sturdier boots such as the white men wore but he found the soft moccasin was ideal for most of the terrain he travelled; it protected his feet yet gave him superb control of weight disposition. It was thin enough to have great sensitivity so that if necessary his weight could be shifted instantaneously to prevent the breaking of a twig when he was stalking either game or his enemies.

In direct contrast to the modern urbanized Indian and his white neighbours, there is very little evidence that the pre-Columbian Indian had much foot trouble. Claw toes, bunions and similar abnormalities evidently were unheard of. And only a minimum amount of wear and tear arthritis was found.

We think we have come a long way in our civilization but we have failed to fit our feet and footwear to our environment with the same skill as the Indians did.

Dr. Bateman ended his paper by suggesting that the Indian's favourite plea to the great spirit could well be used by us today: "Let me not criticise my brother until I have walked at least 20 leagues in his moccasins".

The Medical Post
July 6th, 1976

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Viking home found

Normally reticent archaeologists, who launched a well-publicised two-year dig in York, England, earlier this year to find the heart of a Viking city, have been rewarded already. Within three weeks of starting they have uncovered a Viking home. The discovery came when they took up the concrete floor of a Victorian cellar in Coppergate in the centre of the city. Underneath were the plank floor, sill beams and door posts of an eleventh century building. Peter Addyman, director of the York Archaeological Trust and in charge of the excavation, said they were startled to find Viking structures just under the nineteenth century remains.

His decision to dig was based on more than guesswork. York was the capital of the Viking kingdom in Northern England from 876 to 954. Jorvik, as the Vikings called it, was a prosperous commercial centre and the site now being excavated was possibly the town market. The site runs from the street to the River Foss and the building just discovered (only about 16 ft. by 10 ft.) would have been timber-framed, with wattle and daub or plank walls and a thatched roof. Indeed it may be one of a row of houses stretching in a terrace down to the river bank. In the next two years the excavations will reach the river and possibly uncover the wharves, warehouses and boats of the Viking merchants.

The York dig - the first one to take place in a Viking town in England - has been hailed as greatly significant. Mr. Addyman hopes the work will dispel the popular image of Viking plunderers in Wagnerian horned helmets (which they never wore) and restore the Vikings to their rightful place as merchants largely responsible for re-establishing urban life after the Dark Ages. Early in the ninth century the Vikings had been the scourge of western Europe, but by 876, when they established their hold over northern England from York, they had discovered that expanding trade was more profitable than loot and pillage. York became the commercial centre for the western Viking empire, with trade links as far as Samarkand and Tashkent. Under first Danish kings, then Norwegians, York became the second city of Britain. Finally the English kingdom to the south, first united by Alfred the Great and then strengthened by Athelstan, recaptured York and in 954 the Vikings moved their western capital to Dublin.

When the site opened to the public for the first time in June, a group of Norwegians were among the first visitors. They were witnessing the first episode of a new Norse saga in York which, over the next two years, promises to yield many surprises.

Patricia Connor
Sunday Times

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Greece, Crete and Turkey

O.A.S. member Astrid Maak has been on a trip through Greece, Crete and Turkey, taking in the Knossos Palace in Crete, the museum at Heraklion, the Kindos Acropolis at Rhodes, Ephesus in Kusadasi, and Delos.

She was impressed by the archaeology of Ephesus. She has lots of pictures, and interested members may phone her at Meaford (519) 538-2406.

Following are two reports on addresses to the Ottawa Chapter, O.A.S.
Reprinted from ARCHAIC NOTES

Human Tissue Preserved 3,000 Years in Ontario - Dr. Howard Savage

In recent decades, we have been hearing a great deal about the preservation of human tissues through many centuries and even millenia, usually by a combination of factors. The excellent preservation of the mummies of Egypt was accomplished in pre-embalming days by superficial burial in the hot, dry desert sands, and from the Third Dynasty of the Old Kingdom onwards, i.e. from about 2700 BC, by increasingly sophisticated embalming methods; these included dehydration by immersion or covering with natron (sodium bicarbonate and sodium chloride), application of hot gums or resins, cedar oil, myrrh, cinnamon, palm-wine and other substances [Harris and Weeks, 1973].

The mummies of the Inca cultures of Peru and the mummies found in caves in coastal British Columbia were produced by natural desiccation in an airy, protected environment, which allowed preservation of tissues and retention of the human features and form.

In northwestern Europe and particularly Denmark, Iron Age Man between about 100 BC and 500 AD placed some of his executed criminals, human sacrifices and enemies in peat bogs. Here the high tannin and iron content and mildly acid reaction of the bog water, and total exclusion of air preserved the soft tissues of these individuals, although having a deteriorating influence on their bones. Such bog burials have also been found in Holland, Germany, Norway, Sweden and the British Isles.

Tissue preservation by subzero temperature under natural conditions have been reported many times. Several woolly mammoths have been found well or partially preserved after 10,500 years in frozen muck in northern Siberia north of the Arctic Circle.

Present day embalming by funeral directors makes use of various chemical agents, e.g. formaldehyde-containing fixatives, sodium benzoate, sodium citrate, aromatic oils and other compounds, as extracted from an Anthropology Department paper by Isabel Czuba.

In Ontario, we do not have the climatic extremes of months of hot, dry, dehydrating weather, or year round subzero temperatures, which would preserve soft tissues. Nor do we have peat bogs with high tannin and iron content. In the past, there have not been here cultures which went to extreme lengths to preserve the bodies of their rulers or relations.

Until recently, the oldest known preserved soft tissue in Ontario were portions of beaver pelt, adherent to a copper kettle at the Ossossane ossuary in Simcoe County. Their ceremonial "Feast of the Dead" was held there by Huron villagers in 1636 AD, when the deposition of three copper kettles, many beaver pelts and the disinterred skeletons of some 500 Hurons were given second burial. These proceedings were witnessed by Father Jean Brebeuf and recorded in the Jesuit Relations of that year; Father Brebeuf, you will recall, was martyred in March 1649.

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The Hind Site

I should like to tell you about the recovery and recognition of immensely older human tissue which came to light in 1968 during excavation of a multi-burial complex, the Hind Site, by Mr. William Donaldson, Stan Wortner and other members of the Ontario Archaeological Society. This site is located on a sandy knoll in Big Bend Conservation Park, on land leased by Mr. Herman Hind, adjacent to the Thames River, three miles southeast of Wardsville, Ontario. Skeletal material from some 35 individuals as in-flesh burials and as cremations, is characterized by its wonderful state of preservation. The surface and ends of the bones of the burials are almost invariably intact, and have lent themselves to detailed examination and recording by Susan Pfeiffer, of the Department of Anthropology, University of Toronto at Erindale College. Similarly, the wealth of faunal grave goods is noteworthy for their good condition, which has enabled their mammalian source species to be identified to white-tailed deer, black bear, gray fox, raccoon, marten, fisher, beaver and others.

Bill Donaldson has considered this site to have a Late Glacial Kame Site dating in the vicinity of 3,000 BP, or about 1,000 BC, on the basis of its assemblage of lithic, copper and bone grave goods. Glacial Kame people are described by Ritchie as having lived in the vicinity of the lower Great Lakes, between 1600 BC and 1000 BC. Typical grave good findings are copper tools and beads, shell beads and gorgets, with free use of red ochre on human skeletal material.

A sample of cremated human bone from the Hind Site collected in 1970 was radiocarbon dated by the Gakushin Laboratory in Japan, through the good offices of the Archaeological Survey of Canada, of the National Museum of Man, Ottawa. However the sample of cremated bone did not give satisfactory results. Perhaps a few words on radiocarbon dating may be helpful at this point.

Radiocarbon dating is essentially determination of the degree of radioactivity of substances containing carbon having an atomic weight of 14. Exposure of carbon having an atomic weight of 12 to cosmic rays is followed by the production of carbon having the atomic weight of 14. This carbon 14 is an unstable substance, which very gradually reverts to carbon 12, and while so doing emits rays, whose intensity and numbers can be measured by a Geiger counter. Carbon 14 is now generally accepted as requiring 5,568 years \pm 30 years for its radioactivity to be reduced to one-half of what it was when formed by exposure of carbon atoms to cosmic rays.

Such C14 from cosmic ray exposure is picked up as CO₂ by plants and incorporated into themselves during the life-time of the plant, but obviously ceases when the plant dies or is eaten by mammals. Mammals in turn incorporate the radio-active C14 atoms into their tissues, e.g. bones, where the gradual conversion of C14 to C12 atoms continues to occur. Relatively little C14 in CO₂ is breathed in by mammals and is fixed in their tissues directly. Hence the amount of loss of radio-activity of carbon in a bone is an index of the period of time since its formation in plant tissues which were subsequently eaten by a mammal.

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Human Tissue Preserved - cont'd

Of the 18 in-flesh burials excavated by May 1974, five showed association with copper artifacts, as cylindrical copper beads with Burial 23. Green discoloration of the surface of these copper objects, as well as of their immediate surroundings, was very evident.

Excavation of Burial 15, later determined to be an adolescent male, exposed a double strand of short, thick tubular copper beads, and much greenish-black staining in the vicinity of the neck and hands. This entire area was wisely removed as a unit. Some of the copper beads were found to have a fabric impression, described by Donaldson as of a fine twilled plaiting. During subsequent meticulous removal of the sand matrix, a black organic mass was found in the foramen magnum at the base of the skull. This black mass was composed of a dry, brittle, black, flaky material, measuring up to several millimetres in length and thickness. Many similar smaller flakes were mixed with the sand filling the cranial cavity. No non-human bone was found in the vicinity of the foramen magnum or within the cranial cavity of the skull.

Three or four small flake specimens were kindly taken by Dr. Peter Lewin, and prepared under his direction in the Path. Lab. of the Hospital for Sick Children, Toronto, for sectioning. Using Ruffer's technique, published in 1921, these pieces of tissue were hydrated in an aqueous solution of alcohol and sodium carbonate, fixed, then dehydrated before imbedding, sectioning and staining. To the amazement of all concerned, there were present microscopically under 40,000 magnification readily recognized bundles of collagen fibres and loose connective tissue with intact nuclei. Spores were also in evidence. Another section at 120,000 magnifications showed nerve tissue with the characteristic fine striations of myelin fibres. Thus encouraged, the skull of Burial 15 had the tip of one of its green-stained styloid processes removed, decalcified, sectioned and stained with an haematoxylin-eosin solution. An Haversian system with its central canal and concentric lamellae is shown.

The degree of cellular preservation in these microscopic sections must be associated, I believe, with a high copper content. Copper salts in solution are known to be markedly toxic to fungi and algae, and fairly effective against bacteria of the B. Coli group (Sollman, 1942). Traces of copper occur universally in animals and plants, human spleen, kidney and lung averaging about 0.25 mgm. per 100 gm. An assay of three or four small flakes of the foramen magnum tissue of Burial 15 was kindly done by Dr. Joe Mandarino, of the Department of Mineralogy and Geology of the Royal Ontario Museum, and showed a substantial amount of copper.

The presence of microscopically recognizable tissue in Burial 15 made its precise dating a matter of importance. Hence 100 grams of less essential bone of this skeleton, i.e. 11 ribs, 3 vertebrae and the sternum, were selected, and kindly forwarded by the Archaeological Survey of Canada to the University of Saskatchewan for radiocarbon dating. All of us who had worked with this material were gratified when its dating was found to be 2875 years \pm BP, or about 925 BC.

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A sequel of the establishment of human tissue in the vicinity of the copper beads of Burial 15 was the investigation of deeply green-stained, thin, sheet-like material, adherent to the surface of one of the copper axes with Burial 23. The axe had been found resting on the skeleton of the hand of this burial. Inspection under low powered magnification showed many parallel, close spaced, finely elevated ridges on the surface of this material. These ridges suggested the epidermal ridges of the human palm.

Microscopic sections of fragments of this sheet were prepared in the Pathology Lab of the Hospital for Sick Children, but were found by Dr. Lewin to be plant in nature. Dr. Michelle Heath, Assistant Professor in the Department of Botany, University of Toronto, kindly reviewed these sections in July, 1975, and reported these fragments to be from thin sheets of wood, almost certainly hardwood. The secondary thickening in the xylem elements suggested a hardwood species such as one of the maples. The nature of a thin sheet of wood in contact with an axe head in a human palm is suggested as possibly a part of a sheath for the axe head. The parallel, closely spaced ridges are suggested by Dr. Heath as resulting from differential preservation of the elements of wood which make up the grain of wood.

The preservation of organic material by contact and impregnation with copper salts has been recorded in surprisingly few archaeological sites in North America. Dr. Ken Kidd, now of Trent University, was one of the first in Canada to report in 1952 the recovery of portions of beaver pelt, as mentioned earlier. Dr. Walter Kenyon of the Royal Ontario Museum found in 1964 at the Oak Point Island Site on Georgian Bay and in use about 1750 AD a copper kettle, in which were green-stained portions of meat-like tissue, and were interpreted as preserved pemmican.

Wood preservation similarly was reported by Emerson Greenman in 1951 at the Old Birch Island Cemetery in Georgian Bay, in the recovery of a small wood dish containing a deposit of vegetable material within a brass pail. In April 1975, King, Klipper and Duffield reported at the Rhoads Site in Illinois, in use about 1800 AD \pm 30, the preservation of various pollen species, adherent to the inside surface of a copper kettle and in the matrix touching the pot; the inside matrix not in close contact with the copper was devoid of pollen.

Published reports from many earlier sites containing copper artifacts either in middens or as grave goods with human burials have been reviewed. Such Archaic Period sites include the Morrison's Island Site in the Ottawa Valley, the Frontenac Island Site in the Finger Lake district of New York State, and the Glacial Kame Site at Isle La Motte in Vermont. In none of these sites reports is there mention of preserved human, animal or plant tissue in the vicinity of the copper findings. Similarly, among the Woodland sites, the Serpent Mounds Site, the Donaldson Site and the Levesconte Mound Site on the Trent River, copper artifacts are present in varying degrees of abundance, but no associated human, animal or plant preserved material is reported.

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In conclusion, I should like to attribute the recovery of human soft tissues from the Hind Site, Ontario and in use almost 3,000 years ago, to dry sandy soil of the site, the impregnation of these tissues with copper salts, and the meticulous care taken during and after their excavation.

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Champlain Sea and Early Ottawa River Shoreline Studies, 1975

by Clyde C. Kennedy

The purpose of this project was to continue an archaeological survey in the Upper Ottawa Valley region of the Ottawa River Drainage Basin which has three main objectives: (1) to find Palaeo-Indian sites, particularly in relation to Champlain Sea shorelines, (2) to broaden a study that suggests Laurentian Archaic sites are at relatively high elevations because of a relationship to high early Ottawa River levels which may have resulted from flow into the Ottawa Valley from the Nipissing I stage of the Great Lakes, and (3) to obtain dated palynological data and marine fauna data that provide information on the ecology of periods of occupation represented by known Archaic sites and by any Palaeo-Indian sites that may be found (Kennedy, 1976).

Except possibly for two fluted projectile points, believed to have been found originally in the region of Big Rideau Lake (Kidd, 1951, Garrad, 1971), there are no substantiated reports of Palaeo-Indian artifacts in the Ottawa River Drainage Basin. It is known that collectors have brought Palaeo-Indian artifacts into the drainage basin through their buying and trading of artifacts, but there is no known report of reliable data on Palaeo-Indian finds made in situ in this drainage basin. Particularly instructive in this matter, though not the only case known, is the find of artifacts on a property in Pakenham last year, which was judged to be a collection brought into the region and later discarded.

This apparent absence of evidence of Palaeo-Indian occupation may simply be due to the fact that sites lie along abandoned shorelines that are little frequented compared with modern day drainage and the evidence has not been noticed by farmers and others. But other factors, such as Richard's (1975) report of evidence for a readvance of ice into the Ottawa Valley about 11,200 years ago, could account for a lack of Palaeo-Indian sites.

The Champlain Sea apparently existed in the Ottawa Valley between about 12,800 years BP (Richard, 1974) and 10,000 years BP (N.R. Gadd, personal communication). For the chronology by Prest (1970), the maximum age is too early in relation to Great Lakes chronology by some 1,000 years. If the shell dates are reliable, then the generally accepted dates of shorelines such as those of glacial Lake Algonquin may actually be too young by a thousand years or so. In that case, finds of Palaeo-Indian artifacts along and near Lake Algonquin shorelines may be fortuitous - the artifacts may not indicate occupations related to existing water planes.

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Neither Champlain Sea nor early Ottawa River shorelines have been mapped in detail throughout the Upper Ottawa Valley. Except for strandlines at lower elevations close to the present Ottawa River, relatively short sections of strandlines appear intermittently across the westerly side of the region because of the extensive rock outcrops. Considerable effort must be placed on finding beach deposits which can serve as indicators for the elevations and areas likely to be fruitful for searching. Furthermore, "Differential depression and uplift during and following the retreat of the ice sheet has made it impossible to assume a single elevation for the maximum level of submergence throughout the Ottawa Valley". (Fransham, Gadd and Carr, 1976)

Various areas between Pakenham and Petawawa were examined in connection with both Champlain Sea and early Ottawa River shorelines but all the work cannot be detailed here. Marine shells were found in O'Brien's pit, 11 miles east of Pembroke, at an elevation of at least 550 feet above sea level. Allen collected marine shells at Dunn's Hill southeast of Westmeath, at an elevation of 519 feet, that yielded a radiocarbon age of $11,100 \pm 160$ BP (GSC-1664; Allen 1971: 119). It would be interesting to date shells from the O'Brien pit at Pretty's Hill to compare with the date on shells from Dunn's Hill, where the collection site is some 30 feet lower. A water plane at 550 feet would have extended beyond the Indian Point moraine, which Fransham, Gadd and Carr (1976) indicate on their map as the most westerly (up Ottawa River) point for evidence of Champlain Sea waters.

Some years ago I discovered a clay deposit at Downey's Point, six miles north of the Indian Point moraine, that requires detailed geological study. Varved clay occurs in the bay proper, but a small clay bluff at the upriver extremity of the bay could be evidence of extension of the Champlain Sea further up the valley than the Indian Point moraine.

The Ontario area encompassed by the Arnprior (31 F/8) and the Renfrew (31 F/7) map sheets was selected for major survey during the 1975 field season. The area extends about 48 miles east and west. A large portion of the area consists of Champlain Sea clay plain, but within it are abandoned river channels and small Champlain Sea beaches. Furthermore the area lies reasonably close to the Fulton pit near Clayton where Richard (1974) found a Champlain Sea beach at an elevation 550 to 560 feet with marine shells that dated to $12,800 \pm 200$ BP (GSC-1859).

The 550 foot contour was selected as a "baseline" for seeking marine features as guides to suitable areas for searching farm fields and topographic features. Reconnaissances were made above and below this elevation. A beach deposit was noted at the McMillan pit five miles east of White Lake Village, at an elevation of 425 to 450 feet, and marine shells were collected near Dewar's church, about three miles northwest of Braeside, also at an elevation of 425 to 450 feet. No cultural materials were found in fields near these and other places, although reports of artifacts having been found in the past will engage our attention during the 1976 field season.

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Much of the 1975 field season was spent in the White Lake area where we discovered previously unreported high beaches. At the Campbell property at Hayes Bay, 2.7 miles southeast of St. Andrews Church in White Lake village, we noted a beach deposit some 15 feet above the level of White Lake, which has been dammed for many years and is accorded an elevation of 530 feet. Robert Campbell informed us that when he came to the bottom of the sand in his pit he struck clay and dug 12 feet into it hoping to hit more sand. We were able to confirm that there is indeed a clay deposit, but drilling or the use of earth moving equipment would be needed to determine its depth and characteristics.

Following along our 550 foot "baseline", we found on the Donald Scott property a firepit in the face of an active sand pit. As the pit was endangered by both contract sand removal and the drying out of the pit face, we decided to excavate the firepit. This remnant of an Indian occupation that was almost totally destroyed by sand mining was designated the White Lake-1 (WLL) Site.

The site is a quarter of a mile from the edge of White Lake and some 20 feet higher than the lake, but a marshy area lies between the site and the lake. The Geological Survey of Canada decided to radiocarbon date charcoal from the firepit in view of its elevation and a sample was submitted with the notation that no diagnostic artifacts had been found - only quartz, quartzite and chert flakes - and the firepit could be relatively recent. A radiocarbon age of 3770 ± 60 BP (GSC-2237) was obtained.

It may be possible to excavate four or five 5-foot squares at the site - sand mining has extended in places to the marble bedrock - and this will be carried out during the 1976 field season.

On August 31, 1975, we examined the Hanson sand and gravel pit about 2.1 miles by road northwest of St. Andrews church in White Lake Village. We concluded from the well sorted sand and pebbles in one part of the pit, and some ripple marks, that this was a beach at about 550 feet as suggested by the map contour. No marine shells were found then nor during regular following visits to the pit from which several contractors were hauling sand and gravel. Colour and black and white photographs were taken to record features before they were destroyed, and these were shown to staff of the Geological Survey of Canada.

On October 10, 1975, Allan Jones was loading sand at the Hanson pit when he noted a large bone (radius) which he thought was unusual. He placed this in the cab of his truck and continued to load sand, which he took to Renfrew 12 miles distant and dumped at a school. The next day, when he was levelling the sand in Renfrew, he found a humerus, two phalanges and an as yet unidentified bone.

Four of the bones were tentatively identified by R.C. Harington, Curator, Quaternary Zoology, Palaeontology Division, National Museum of Natural Sciences, as from the right forefin of a bowhead whale (*Balaena mysticetus*). Harington took drill samples from the humerus for radiocarbon dating, the result of which is awaited.

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Champlain Sea - cont'd

As a cottage road was being driven along the south side of Three Mile Bay, White Lake, where we had previously noted sand during a reconnaissance by boat, we explored along the road line in search of beach evidence close to the 550 foot contour. At what we named the Snye pit we found unusually well preserved ripple marks some 25 feet above the level of the lake. These were photographed in black and white and colour to preserve a record of what is probably a Champlain Sea beach.

The Campbell, Snye and Hanson pits indicate that the White Lake basin was an embayment on the westerly shore of the Champlain Sea.

Wagner (1970) measured six species of marine molluscs from the Ottawa area and westward in relation to dwarfing believed to be due to less saline conditions as compared to salinity in the Atlantic Ocean. Wagner noted that of the 98 species that she had collected, "only 15 penetrated into the narrow extension of the sea beyond the Ottawa area".

Collections of marine fauna were made during our survey to see what information the specimens might provide on the ecology of the Champlain Sea. Of special interest was a gastropod found by Clayton Kennedy in a concretion at Flat Rapids, about eight miles up the Madawaska River from Arnprior. This has been identified as an Arctic, high salinity mollusc by Dr. A.H. Clarke, Chief, Invertebrate Zoology Division, National Museum of Natural Sciences. Further investigations will be made in the Flat Rapids region during 1975, for the concensus of geologists has been that brackish water prevailed in the westerly region of the sea.

In connection with our long-standing interest in the fact that Laurentian Archaic sites and scattered artifacts occur along the Ottawa River at elevations greater than 20 feet above the present level of the river, and that this situation may be due to the flow of the Nipissing I stage of the Great Lakes into the Ottawa Valley (Kennedy, 1963), we have sought further evidence of Archaic occupations. Artifacts from properties in Stafford, Pembroke and Westmeath townships have sustained a likelihood of higher river levels during Archaic times, particularly those from a site on an abandoned river channel.

To obtain dated palynological data in connection with the periods of occupation being studied, and to add information on when certain land surfaces emerged from the early Ottawa River, part of the archaeological research includes a plan to take cores in small lakes. Previous cores taken in the Ottawa Valley by the Geographical Survey of Canada have, with one exception, been dated only in the deepest section, for the GSC was interested in obtaining data not related to archaeological studies.

On June 19, 1975, R.J. Mott, Palaeoecology Laboratory, Terrain Sciences Division, Geological Survey of Canada, obtained a core in Clement Lake, Canadian Forces Base, Petawawa, in connection with this archaeological project. A sample of gyttja at the bottom

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Champlain Sea - cont'd

of the organic lake sediment yielded a radiocarbon date of 9810 ± 130 BP (GSC-2153; Mott, personal communication). Mott noted that the sample will date the beginning of organic deposition at this site which began when a channel of the ancestral Ottawa River fell below an elevation of 415 to 420 feet". Further dating of the core and a palynological study of it remain to be completed.

The Clement Lake date indicates that the lake was isolated from the proto-Ottawa River by at least 9,800 years ago. The river apparently dropped at least 15 to 20 feet during some period between then and at least 6,700 years ago, the date obtained for the St. Joseph's channel sample on Allumette Island. The latter was obtained from a sample of gyttja in an abandoned river channel at an elevation of 400 feet, 1.4 miles east of St. Joseph Village: 6730 ± 250 BP (I-1226; Kennedy, 1970:63; Boyko-Diakonow and Terasmae, 1975:191).

Acknowledgments:

I thank crew members Hugh Daechsel, Clayton Kennedy and Harry Hinchley whose able and energetic assistance during 1975 and in previous years made this project possible. Greatly appreciated is assistance of various kinds by Dr. N.R. Gadd, Dr. W. Blake, Jr., Peter Fransham, and R.J. Mott of the Geological Survey of Canada; C.R. Harington and Dr. A.H. Clarke of the National Museum of Natural Sciences; Dr. Roscoe Wilmeth, Dr. George F. MacDonald and David Keenlyside of the Archaeological Survey of Canada, National Museum of Man; and the many property owners, particularly Donald Scott who permitted excavation on his land, who made us welcome, and those who loaned artifacts for study and who will be acknowledged elsewhere.

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Forthcoming Events

Gold of the Gods Exhibition is coming to the Royal Ontario Museum from the Museo Oro del Peru. Dates: September 28 - November 21, 1976.

Iroquois Symposium at Rochester Museum & Science Center

The Rochester (New York) Museum and Science Center will hold a symposium, "The Iroquois in the American Revolution" on Saturday, September 18. Participation by a representative of the Iroquois Confederacy has been invited to provide the Iroquois' perspective of the American Revolution.

Symposium registrants will also tour the RMSC's current, major exhibit "Images from the Longhouse : Paintings of Iroquois Life by Seneca Artist Ernest Smith, 1907-1975" with Rochester Museum Director and Curator of Anthropology, Charles F. Hayes. The registration fee for the day-long symposium is \$10. Interested persons wishing for further information should contact George R. Hamell in the Anthropology Section of the Rochester Museum and Science Center at (716) 271-4320.

Historical Archaeology Conference

January 5-8, 1977: The 10th Annual Conference of the Society of Historical Archaeology and 8th International Conference on Underwater Archaeology at the Government Conference Centre and Chateau Laurier Hotel, Ottawa, Ontario. General Chairman: Jervis D. Swannack, National Historic Parks and Sites Branch, Dept. of Indian and Northern Affairs, 1600 Liverpool Court, Ottawa, Ontario K1A 0H4. SHA Program Chairman: DiAnn Herst (address as above); ICUA Program Chairman: Walter Zacharchuk (address as above).

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