GEOLOGY
'73-'74

GEOLOGY JOURNAL

1972-73-74

Lakehead University

LAKEHEAD UNIVERSITY
DEPARTMENT OF GEOLOGY

THIRD EDITION

Compliments of

the Office of the President

Dr. A.D. Booth

Congratulations

and best wishes to the graduates

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Geologists

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from
the faculty of
science
lakehead university

Dean R. A. Ross

Message From Dr. Booth

Some readers of this Yearbook may know that Lakehead University has recently been developing an Academic Plan. The first draft of this, usually called "The Skeleton" because of its front cover adornment, sets out certain principles which I believe to be appropriate in the development of this institution as a regional university.

Looking at Northwestern Ontario, a number of points become obvious: first, the possession of large tracts of forest; second, the Canadian Shield and its relatively unexplored geological wealth; third, the lake; and fourth, but by no means the least important, the people of the region.

Lakehead already has a Forestry School of some distinction and one which, we believe, in due course, should be the best in Canada.

The Second of my primary areas of development is Geology, and I can see that this is likely to expand in two distinct phases. In the first of these, the Exploration Geology of Northwestern Ontario should be the object of the main thrust. Certainly there is need for the discovery of new ore bodies. Places such as Atikokan are dependent on existing resources, the end of which is already in sight. If new and important resources can be found, particularly in that area, a pleasant town may be saved from going the way of similar places in Alberta and British Columbia which have become ghost towns. This exploration phase, which is important, both to regional economy and to pure geology since it contributes, of course, to the theories of crustal structure, will be followed and probably parallelled at some point by what I can describe as Exploitation Geology which leads indirectly to Mining Engineering. The importance of the two phases of the plan lies in the fact that industrial and commercial backing for the university's activities should be forthcoming and that the government will be ensured of the regional devotion of our institution. Another advantage of the plan, which involves the participation of industry, lies in the employment possibilities for students during vacations - something which is at the root of instruction in all professional subjects.

I hope that these remarks may do something to inspire the students in the Department of Geology with the importance of their subject, their mission and their departments in the present and future of this University.

ANDREW D. BOOTH

MESSAGE FROM THE DEAN OF SCIENCE

The principal problem facing Lakehead University this year has been the decrease in student numbers. This phenomenon has occurred in practically all universities in North America and Western Europe. Lakehead has not endured a unique experience. Perhaps an enrollment decrease would be regarded as a positive factor if it could be interpreted as showing a trend towards a higher quality and more dedicated studentry. However, our financial returns from the Provincial government are directly related to student numbers and when these decline significantly, the institution trembles, becomes hypertensive and narrowly misses the trauma of a corporate nervous collapse.

Such experiences occur regularly in industry and commerce. If a commodity has lost favour in the market, then its producers must revamp or replace it. Failure to react successfully to this challenge generally results in personnel cutbacks and plant closures. Whereas the industrial environment is prepared for such eventualities, the university one is not. By their very nature the universities attract staff of a highly intellectual and sensitive type. They are not well paid by industrial standards, but forego pecuniary ambitions in favour

of a modest living which allows them the privilege of imparting knowledge to their students and pursuing their own individual research and scholarly work. It is no criticism to state that university professors and lecturers are less able to cope with the rough, tumble and consequences of shifts in market-demand than are their industrial counterparts. The fact is, however, that they are becoming increasingly compelled to react to these shifts.

Since the middle ages, all of the major institutions of state and church in Western civilization have had to undergo radical changes. Some have survived the experience while others withered. The universities have endured minor perturbations over these centuries, but have probably never been subjected to the same external scrutiny as they are at present. We all have a responsibility to assuage and convince our critics through our performances and actions of the tremendous and benevolent effect that the university can and does have on our society. We need to have effective ambassadors, and, in the Faculty of Science at Lakehead University, the Geology students are among the best that we have. It is pleasure to be associated with them.

Once again, I am delighted to commend the enterprising and good-humoured students in the Department of Geology for the format and the high standard of the articles chosen for the Geology Year Book.

Warmest congratulations and best wishes to all,

R. A. Ross

R. A. Ross,
(Dean, Faculty of Science).

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from

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Dr. Edward Mercy

CHAIRMAN'S MESSAGE

The publication of this, the third Year Book, demonstrates a continuing involvement in their professional development by its student contributors and organizers. I am more than glad, on behalf of the Department, to welcome this account of student affairs during the past academic year.

The tradition of the Year Book is an excellent one and I sincerely hope that, through your efforts, you will have established the tradition in this Department so that those coming after you will continue this good work. There is no doubt that the Year Book makes a significant contribution to the healthy growth of the Department.

To all who have helped in the production of this volume, my heartiest congratulations.

Edward Mercy.

Edward Mercy,
Chairman.

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PRESIDENT'S MESSAGE

This has been a very successful year for the Geology Club. In keeping with the reputation we built for ourselves last year, the Club took on the major role of the University's Winter Carnival. This was done by sponsoring the Queen and King contest. Our two entries, Sharon Tihor and Doug Lehto faired very well. Doug went on to be crowned Carnival King and will unfortunately have to relinquish his throne next year, hopefully to another Geology student.

Apart from Winter Carnival the Club put on two exceptionally successful beer bashes. As the academic year drew to a close the Geology Club Social held in the Prosvita Hall marked the end of the social calendar.

I would like to at this time to introduce the Executive of the Geology Club for the past year, and to thank them for their participation and dedication.

Vice-President:	Bob Scott
Secretary/Treasurer	Eric Brown
Social Directors:	Ralph Bullough & Peter Friske
Year Book Editor:	Barry Pinn

Special mention goes to Barry Pinn, Editor of the Geology Year Book, and his staff for the laborious hours which they have spent in the publication of an outstanding Year Book.

David Powers,
PRESIDENT,
GEOLOGY CLUB.

ON THE GENESIS OF GRANITE

by

M. YUMA

In the beginning God created the Heaven..... and the Earth.

And the earth was without form, and void; so begins a well known story expounding a certain belief on the origin of the earth and granite since granite is a rock occurring near and on the surface of the earth. To a person supporting the democratic principle, that the majority opinion is correct, this would explain the origin of granite satisfactorily. However, we, being individualistic and schooled in geology like to think that this creation is not quite finished yet.

It must be admitted though that the origin of the positive and negative changes that combine to form matter is unknown. We, geologists, come into this when the earth was without form, a swirling mass of dust and gasses, and imagine that the "force" of gravity was present which formed this "ready created" dust into our earth.

It is assumed that the reader agrees that the earth is a better sphere than the best basketball made by man; and also that energetic (heated) matter tends to rise to the "surface", i.e. heat energy flows from a hotter to a cooler object.

As a direct result of this remarkable observation, it can be stated that the concentration of radioactive isotopes is greatest in the rocks of the crust. Recall geothermal gradient. Also it is known that the radiogenic heat output was greater yesterday than today. Recall exponential decay function of all radioactive elements. This would also imply that the surface temperature of the earth, especially of granitic areas, was higher in the distant past. This is shown by the gaseous envelope around it (all expelled from the earth). Also water molecules cover 75% of the surface.

Our "granite" stands out from the water, as the continental "floats". Recall isostasy. These continental "floats" are essentially granites and their derivatives. They were and are formed by contamination of the insoluble residue (silicon dioxide and aluminum silicates) by the liquid remaining from fractional crystallization of the basaltic magmas. This silica enrichment must precede granite formation. This enrichment occurs on the surface essentially. The contamination takes place near the surface under cover of the very "wet" sediments. Because of the lower density inherent in these "granitoid" rocks and because of the badly fractured platy nature of the earth's crust, these granitoid rocks tend to drift to the points of highest gravitional field strength, which are presently in the

vicinity of the poles. Guess where we find most of the earth's granites? That's right, near the poles!

This is normal and expected since the earth is not a perfect sphere.

The granites make up only about 1/10 of one percent of the atoms in the earth but these are mighty important atoms for us air breathing creatures.

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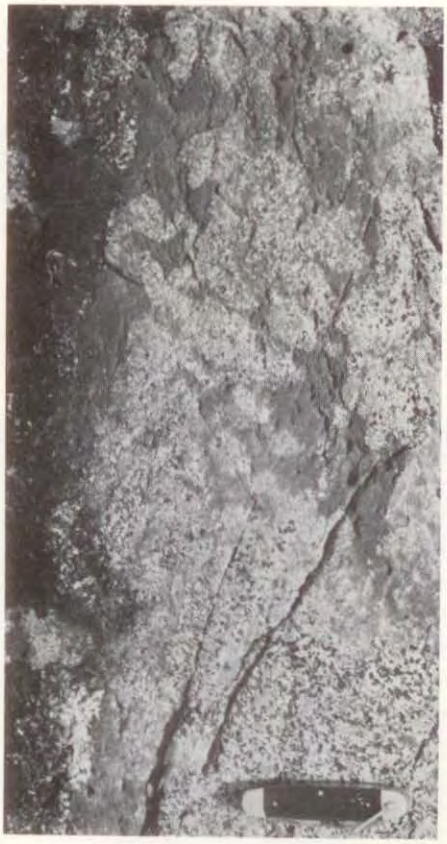


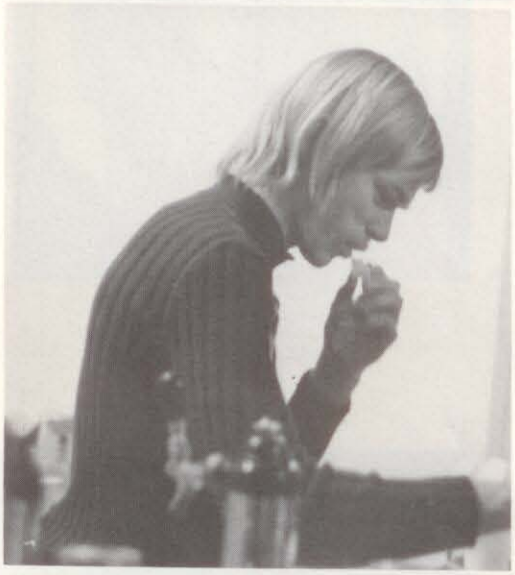
TRIPS

Winter Carnival

1972-73

King & Queen Contest

Spring



Social

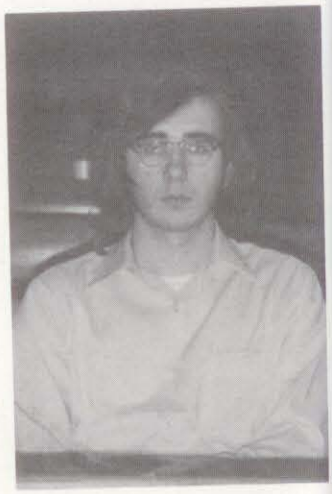
Bill McLelland

Bruce Hicks

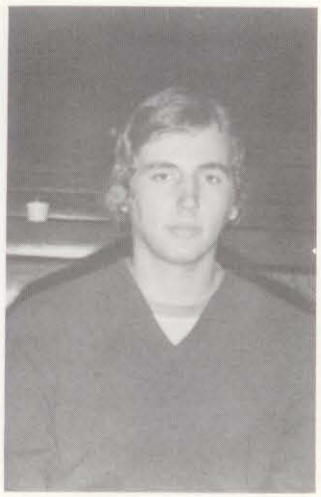
Frank Smit

Bill Blottner

Dave Evans

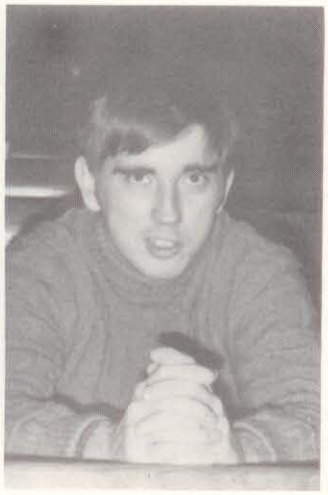


John Biczok

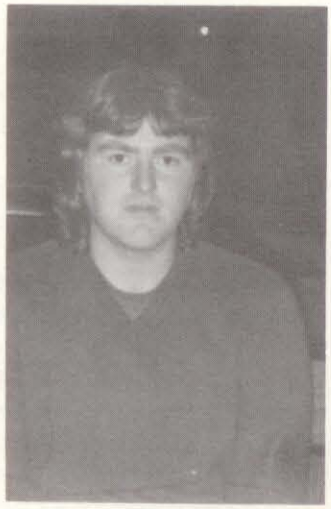


Marvin Humphreys

Jeffrey Armstrong



William Eismont



James Rybar

John Carlin

First Year

1972 · 73

NEIL CAMPLING

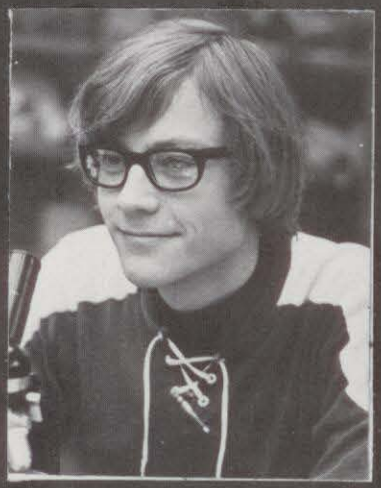
NEIL R. CAMPLING

Some Mineralogical, Textural and Environmental Aspects of the Pre-Gunflint & Pre-Sibley Weathered Profiles

In the Thunder Bay region, ancient weathered profiles occur in the stratigraphic column below the initial sediments of the Gunflint and Sibley Formations. Both profiles consists of weathered granitic rock and a lithified, granitic derivative.

The Pre-Gunflint profile is characterized by a remarkable increase in chlorite mineralization, and a very poorly-developed residual soil texture. These and other mineralogical features tentatively indicate the Pre-Gunflint weathering occurred sub-aqueously in a temperature, estuarine or tidal-flat environment.

The Pre-Sibley profile is characterised by an increase in hematite mineralisation, and a well-developed residual soil texture. These and other mineralogical features tentatively indicate that Pre-Sibley weathering occurred subaerially in a humid, temperate climate. Only the Pre-Sibley weathered profile can be termed a paleosol.



GEORGE EINARSON

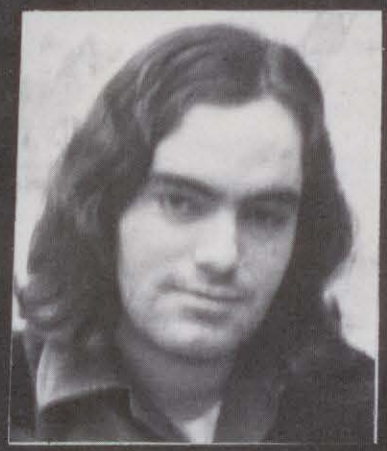
Pillow lavas from Archean volcanic-rich supracrustal units in the Superior Province of Northwestern Ontario were studied on a regional scale to identify possible variations in the style of metamorphism.

Chemical analyses indicate that metamorphism has not affected the basic chemistry of the pillow lavas in most cases. Volatile contents vary in the lower grade of metamorphism, however, significant metasomatism has occurred in only a few localities. Both tholeiitic and calc-alkaline chemical affinities were noted in pillows from various areas. Chemical variations within individual pillows which have undergone relatively little alteration suggest differentiation processes may have occurred during the crystallization of the pillows.

The pillow lavas of the Lake Nipigon-Geraldton-Jackfish area are of a low metamorphic grade with mineral assemblages corresponding to the greenschist facies. Variations in the scale of mineralogical homogeneity and the degree of recrystallization indicate that moderate pressure conditions prevailed in the Highway 11 area between Beardmore and Longlac while the Highway 17 area along the north shore of Lake Superior was characterized by very low stress conditions. This indicates a variation in the regional metamorphic pattern with greater depths of burial occurring in the northern volcanic-rich unit. The regional metamorphic pattern in the southern volcanic-rich unit may have been overprinted by thermal contact aureoles related to intrusive plutons.

The suite of pill lavas from between the Highway 599 area represents central amphibolite zones bounded to the north at Central Patricia and to the south of Sturgeon Lake by low grade greenschist zones. Mineralogical and textural evidence suggests progressive regional metamorphism.

BRENT PASKE



THE GEOLOGY AND GEOCHEMISTRY OF THE ONAMAN LAKE PROPERTY, NORTHWESTERN ONTARIO

In the thesis a detailed study was made of a small mineral prospect. The Onaman Lake property is located approximately 3 miles west of Onaman Lake in the Thunder Bay Mining Division. The property is underlain by five rock types of Precambrian age: Keewatin acidic and mafic volcanics, Temiskaming conglomerate. Algoman granite and Keweenawan diabase dikes which cut all other rock types. The intrusion of the Algoman granite has had a contact metamorphic effect on the Keewatin mafic volcanics which is characterized by the progressive development of actinolite-tremolite and epidote group minerals in an originally chlorite rich rock.

Cu, Zn and Pb are present on the property disseminated in quartz veins. In order to study the possibility of discovering other occurrences of Cu and Zn, the results of a soil sampling survey were evaluated statistically after separating the sample results into four groups: organic Cu and Zn values and inorganic Cu and Zn values. This study indicates a correlation between geochemical results and observed mineralization but indicates very few other anomalous conditions on the property.

BOB KYRYLUK

STRUCTURES IN MIGMATIC ROCKS

For this study an area along the Spruce River Road was chosen. Numerous outcrops in a 6 mile section were examined, in which a variety of structures occur.

Based on data, a three-fold division in the migmatite complex has been made.

i) Well foliated biotite-plagioclase gneisses interlayered with quartzo-feldspathic gneisses.

ii) Lit-par-lit gneisses, composed of foliated gneisses interlayered with a potassium feldspar-rich mobilizate.

iii) Massive gneisses composed of poorly foliated rocks with vague structures.

No sharp boundaries appear between these three types. A some-what transitional relationship between structures and in mineralogy suggest stages in the degree of mobilization.

A complex tectonic history is demonstrated by the structures in the migmatite. These migmatitic rocks comprise a basement complex overlain by less deformed and less metamorphosed metasedimentary and metavolcanic sequences. In the migmatite complex a fluctuating temperature produced great variations in the amount of melt at any time and thereby affected the complexities observed in the structures.

LES TIHOR

LESLIE A. TIHOR

Archean Evolution of Western Dorion Twp. Ont.

The western part of Dorion Twp. shows evidence of Archean rocks dating from very ancient 'primitive' basaltic crust to Kenoran, late kinematic, quartz monzonites.

The oldest rocks underlie the northern part of the map area and consists of metamorphic rocks of predominantly sedimentary and, to a very minor extent, igneous origin. These metasediments are represented by roof pendants and xenoliths of fine to medium grained, more or less plastically deformed, quartzofelspathic gneisses. The metamorphosed igneous rocks exist as angular blocks of mafic to ultramafic hornblende gneiss. The latter may represent remnants of very early dykes, 'primitive' basaltic crust or possibly 'horses' of mantle material. These roof pendants and xenoliths float in a 'sea' of pegmatitic to micropegmatitic, intensely flow-folded and very leucocratic mobilizate.

At the onset of the Kenoran 'orogeny' this basement assemblage began buckling in low amplitude east-west trending folds. As these folds developed, the synformal portion, now represented in the southern part of the map area by the greenstone belt began filling with basement-derived pelitic sediments, intercalated in later stages with minor amounts of basaltic ash. With time the rate of deformation accelerated and the pressures and temperature became sufficiently high to remobilize the more volatile components of the basement at relatively shallow depth. This caused intrusion of small east-west elongate quartz monzonitic bodies along zones of structural weakness at the edge of the greenstone belt and within the basement complex. These same pressure-temperature conditions caused progressive metamorphism of the pelitic sediments and retrogressive metamorphism of the basement complex to a common middle-amphibolite facies grade.

ALLAN SPEED

ALLAN SPEED

The Investigation into the use of Gamm-Ray Spectrometry as a possible geologic mapping tool

The uses of the gamma-ray spectrometry as a geophysical tool in mineral exploration are well documented (Mero, 1960). However, few investigations into the feasibility of using this remote sensing technique as a geologic mapping tool are known. Thus, the purpose of this study was:

1) to investigate local scale variations in radioelement levels between different lithologic units.
2) to investigate the mineralogical composition of the various lithologic units causing the different radio-element levels.
3) to investigate the statistical problems involved in collecting and presenting data of this type, and
4) to investigate the possibility of using gamma-ray spectroscopy as a physical method which provides information from which geological conclusions can be drawn.

Of the many radioactive isotopes that occur in rocks, only radio-potassium and members of the uranium and thorium series are important geologic sources of gamma-radiation. Two major, N-S traverses through the Gorham Township area crossed granitic batholithic intrusives, two types of sedimentary rocks, volcanic rocks, diabase and gabbro. A portable gamma-ray scintillometer was used to measure the relative radiation effects of the various rock types. The initial count data was converted into more meaningful results using statistical methods, computer techniques, and geochemical analyses. These showed a definite difference in radioelement content of the various rock types measured.

JOE KASARDA

JOE KASARDA

The Alteration and Trace Element Content of the Mattabi Footwall Zone

The Mattabi orebody is situated in the Sturgeon Lake area of Northwestern Ontario. It exhibits many of the features common to Cu-Zn massive sulphide deposits found throughout the Canadian Shield.

Alteration characteristics of the footwall rocks were studied by means of thin sections made from approximately 45 collected hand specimens. The main alteration products observed were sericite and carbonate. Abundant chloritoid and a relatively low chlorite content suggest that magnesium metasomatism was not prevalent during ore formation. No simple zonal arrangement of the lateration minerals is apparent.

A total of 89 samples from 8 drill cores obtained from the footwall rocks were analyzed for Cu, Zn, Ni, Ag, Fe, Mn and Co_2 by atomic absorption techniques. The frequency distributions of the elements were studied in the form of cumulative frequency curves. All the elements appear to be approximately lognormally distributed. Background and threshold levels were graphically estimated.

DAVE POWERS

A BIOGEOCHEMISTRY STUDY OF POPULUS TREMULOIDES APPROACHING A LEAD-ZINC-BARITE DEPOSIT

The purpose of this study is to compare the variation of concentration of the trace elements lead, zinc, copper, and manganese in the various portions of Populus tremuloides with specific physical variables of the plant, such as height, age, and diameter, as well as with soil chemistry.

The elemental levels of zinc, lead, copper, and manganese were measured in samples of soil, bark, old growth, new growth and buds of Populus tremuloides, and bark, old growth, new growth plus buds and needles for Pinus banksiana. Solutions of these samples were analyzed by atomic absorption methods.

Lead is the only element which shows an anomolous concentration in the bark, new growth, old growth and buds of poplar. Old growth and new growth of poplar are the best portions of the tree to sample in order to detect the presence of a lead anomoly. The elemental concentration of lead, zinc, manganese, and copper in the plant organs sampled is affected by the absolute age of the species. The concentration of these elements does not accumulate with age.

With the shallow soil profile, as occurs over the Sibley Group, geochemical soil sampling is a better exploration method for locating lead-zinc-barite deposits than a biogeochemical survey using Populus tremuloides as a sampling species

PAUL NEILSON

THE GEOCHEMISTRY OF THE LYON LAKE-CLAW LAKE SULPHIDE BEARING GRAPHITIC SHALE, STURGEON LAKE, ONTARIO

The Lyon Lake-Claw Lake sulphide bearing graphitic shale is contained within a predominantly sedimentary sequence of course to fine clastics with minor carbonate and mafic volcanic rock.

Sulphide mineralogy consists mainly of pyrite and pyrrhotite occuring as nodules, lensoid pods and narrow bands conformable with bedding. Traces of chalcopyrite, sphalerite and arsenopyrite are present as well.

Cu, Zn, Ni, Co, Mn and As were analysed in sulphides, graphitic shale and wall rock. Results suggest: (1) Sulphides contain higher contents of Cu, Zn, Co, Ni and As than graphitic shale or wall rock and (2) Mn, Zn, Co and Ni content decreases eastward along the formation in graphitic shale.

Analyses of a vertical section through the formation suggests: (1) Cu, Zn, and Mn are enriched in the footwall rocks as opposed to the hanging wall rocks, (2) Zn and As are concentrated in graphitic shale in comparison with hanging wall rocks and (3) Co and Ni content is relatively uniform throughout the section.

Element ratios have been used to investigate the depositional environment of sulphides and host rock. Results show: (1) Co:Ni ratios in sulphides and graphitic shale are consistent with other worker's data for a sedimentary origin and (2) Mn:Fe ratios are suggestive of volcanic contribution to the western margin of the formation.

Carbon content in the graphitic shale varies from 1.60 - 12.06%. X-ray studies indicate carbon is either present in an amorphous form or below the detection limit of this technique.

X-ray studies indicate the pyrrhotite present is monoclinic possibly derived by metamorphism from pyrite.

Evidence suggests that the graphitic shale is derived in a sedimentary basin in which there was volcanic activity at the western margin. This was followed by large scale mafic volcanism. Sulphides derived by sedimentary or diagenetic processes is likely, since there is no evidence for a direct volcanic exhalative source.

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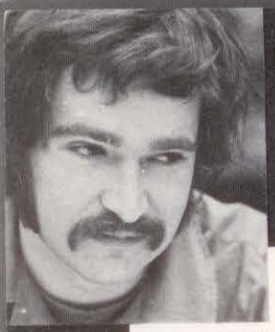


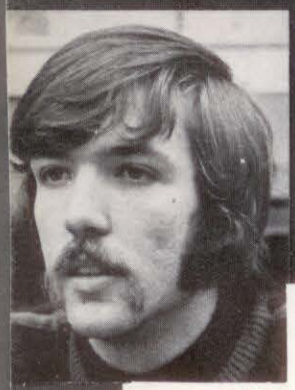
GORD TRIMBLE

STRUCTURE OF AN ARCHEAN SEDIMENTARY SEQUENCE WITHIN THE QUETICO GNEISSIC BELT

The purpose was to suggest a structural model for the metasedimentary rocks (Archean sediments). On structural grounds it appears reasonable to this area to assume that the metasedimentary sequence rests on a basement complex. The unconformity between these two appears to have been remobilized during orogeny and hence is no longer intact.

Based on field observation of sedimentary structures several reversals of top directions were determined. These sediments are basically of graywacke composition. Low-grade metamorphism and non penetrative deformation have left primary sedimentary features intact.

A maximum thickness of 4,700 feet of sediments was established from the model. The folding is tight isoclinal and slightly overturned, originating from a flexural slip and flow mechanism.



ROBERT LARSEN

THE SILICATE AND SULPHIDE PETROLOGY OF THE KAWENE LAKE INTRUSION

The silicate and sulphide petrology of the Kawene Lake Intrusion was studied using a transmitted light microscope, a reflected light microscope, a 4-axis universal stage microscope, point counting, chemical analysis and X-ray methods to determine if this intrusion is a strataform pluton, or an alpine type ultramafic. A tectonic environment is also investigated and an origin for the rocks and sulphides is suggested.

It is found that this intrusion is not a strataform pluton, but is possibly an alpine type ultramafic lying somewhere in between the two suggested and members, namely the ophiolite suites of Newfoundland and the serpentinites of Vermont. It is also found that this intrusion was syntectonically placed in an Archean eugeosyncline, surrounded by flysh-type deposits. It is suggested that both the sulphur and metal, essential to form the sulphides, came from the magma itself and not from the surrounding rocks or the sea water.

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GEOLOGY FACULTY

Dr. Edward Mercy

Dr. Mercy was born and received his early education in geology at the Imperial College of Applied Science and Technology in London, England where he received a B.Sc. and Ph.D. in geochemistry. Dr. Mercy was also a Senior Lecturer at the University of Edinburgh, Scotland. Through the years, Dr. Mercy has done research on geochemical studies of plutonic and volcanic rock in Europe as well as studies on ultramafic rocks as models of the mantle of the Earth.

Dr. E. Mercy

Dr. Manfred Kehlenbeck

Dr. Kehlenbeck was born in Bremen, Germany and came to N. America for his university education. He studied for his B.Sc. in Hofstra University in New York. Coming to Canada, he received his Ph.D. in Geology at Queen's University in Kingston where he has done research in the Grenville Province. After one year at U.N.B. he came to L.U. in 1971 and is presently doing research on tectonic evolution of the Archean crust.

Dr. M. Kehlenbeck

Dr. M. Bartley

Dr. J. Mothersill

Dr. M. W. Bartley

Born in Winnipeg, Manitoba, undergraduate work at University of Manitoba, post-graduate work at University of Toronto. Field Party Leader for Ontario Department of Mines during post-graduate years. Subsequently, Chief Geologist and Production Manager at Steep Rock Iron Mines Limited. First Principal Lakehead Technical Institute. First Chairman, Board of Governors, Lakehead University. Currently in private practice as consultant specializing in ferrous mineral exploration and development. Special Lecturer at Lakehead University since 1971-72 session.

Dr. John S. Mothersill

Dr. Mothersill was born in Ottawa, Ontario. He received his B.Sc. (Physics, Mathematics) at Carleton University and his B.Sc. (Geological Engineering) and Ph.D. at Queen's University. Worked for Standard Oil (N.J.) and Mobil International Oil Co. in Turkey, Nigeria, Colombia and Europe. Joined the Faculty of Lakehead University in 1966. He has been carrying out sedimentological studies of Lake Superior. During his sabbatical leave he carried out sedimentological studies of Lakes Victoria and Chad and the Niger Delta.

Dr. James Franklin

Born in North Bay, Ontario. B.Sc. and M.Sc. at Carleton University. Ph.D. in Metallogeny at the University of Western Ontario. While studying for my Ph.D., I was a geologist with the Geological Survey of Canada. I have been at Lakehead University for 4 years and my research interests are in Precambrian Stratigraphy of the Thunder Bay district and Massive Sulphide Deposit's Genesis.

Dr. J. Franklin

Mr. W. McIlwaine

Mr. McIlwaine was born in Toronto and attended university in Fredericton. He received his B.Sc. and M.Sc. in geology at the University of New Brunswick. Ontario Department of Mines has been Mr. McIlwaine's employer for the past three years in Thunder Bay. He is giving the sedimentology course while Dr. J. Mothersill is on sabbatical leave.

Mr.W.McIlwaine

Dr. R. Mitchell

Dr. Roger Mitchell

Born in Farsley Yorkshire England, attended Manchester University where he received his B.Sc. and M.Sc. degrees. Coming to Canada, Dr. Mitchell studied for his Ph.D. in isotope geochemistry at McMaster University in Hamilton. Since McMaster he has studied at the University of Alberta and University of Oslo in Norway before coming to Lakehead University this year. Dr. Mitchell has done research on sulphur isotopes, kimberlites and rare earth geochemistry.

Dr. H. Loubat

Dr. H. Loubat

Dr. Loubat was born in Souiaae in Southern France. He received his early education in Belgium and France before enrolling at the University of Geneva in Switzerland. There he studied for a B.Sc., M.Sc. and Ph.D. in geology and mineralogy as well as a diploma in geological engineering. In Europe he had done work principally in the French and Italian alps. In 1970 Dr. Loubat was invited back to Geneva as a lecturer in the summer semester. Dr. Loubat participated in an oceanographic expedition in 1971 for the Canadian Oceanographic Institute. The project called "deep drill" was undertaken in the South Atlantic. Since coming to Lakehead University, Dr. Loubat has done research on weakly metamorphosed Archean rock in Northwestern Ontario, as well as a theory of the genesis of pegmatite.

GEOLOGY LABORATORY TECHNICIANS

Ann Sumpter

Ann Sumpter

Ann was born and educated in England and emigrated to Canada in June 1967. She joined the staff of the Department of Geology at Lakehead University in July 1968.
Ann maintains all the requirements of the first year teaching laboratory and manufactures thin sections of suites of rocks for all the department's teaching purposes, of students field trip collections and for the research projects of the Faculty members.

Pat Zurkan

Pat ~~Zurkan~~ Murphy

(Peppermint Patti)

Pat was born and educated in Thunder Bay and has been employed in the Department of Geology for the past 7½ years. She has a wide variety of skills in the secretarial, sedimentological, geochemical and petrological fields. Pat incorporates two interests in one; that of a professional typist and the other as a geological technician. Pat is also well known for her social conventions, eg. Hallowe'en.

R.L. Bennett

Ronald Bennett

Chief Laboratory Technician, 1936 to 1967, The Grant Institute of Geology, University of Edinburgh.

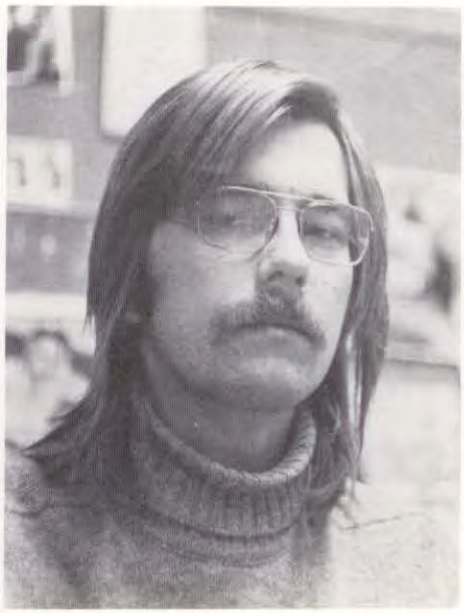
Research, many kinds of technical approaches to Ph.D. studies.

Presently, Principal Technician, Lakehead University.

S.T. Spivak

Sam Spivak

Sam was born in Port Arthur where he received his basic drafting techniques in high school and his geological training while in the employment (for 8 years) of a local mining company and has been draftsman for the Science departments for the past 7½ years. He maintains a fairly extensive map library while drafting time is largely devoted to preparing maps, overlays and drawings for use as teaching aids and research publications.

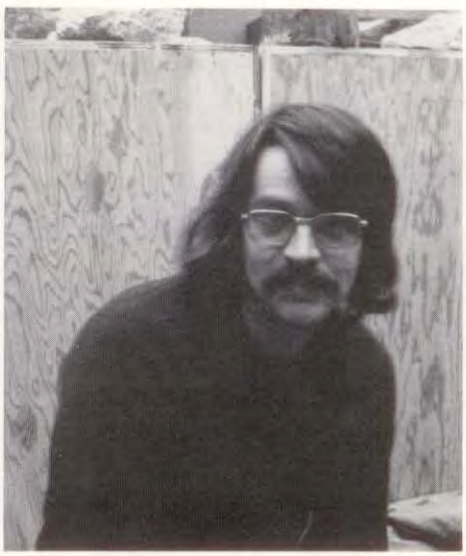


A. Raitsakas

Ain Raitsakas

Resident Seismology Affiliate & Mentor
(Alternate Title - The Lure of Seismology)

Ain was born in England some years ago, emigrated to Kanada several years later where he has remained even until this day.
As a graduate of the prestigious Port Arthur Collegiate Institute, with the promise of an illustrious career ahead, he studied Physics at the University of Waterloo. He then advanced to Lakehead University; assimilating knowledge, working as a research assistant in Biology, before settling down in Seismology.



K.H. Poulsen

Howard Poulsen

Early History: Born, raised and educated educated in Thunder Bay area.

Education: B.Sc. Physics (1968-1970), University of Waterloo; B.Sc. Geology (1972), Lakehead University.

Jobs: Exploration Geophysics (1961-1971), High School Teaching (1968-1969), J. M. Franklin's right hand man (1972-1975).

Interests: Metallogeny, Exploration Geophysics, Evolution of the Archean, Keweenawan Stratigraphy, Farming.

Jean Helliwell

I was born and raised in Toronto 'the good' where I completed my High School education and then a Secretarial course at Ryerson College. Came to the great Northwest in 1967 and for the past 8 years have held the position of Geology Departmental Secretary.

Jean Helliwell

THANK YOU

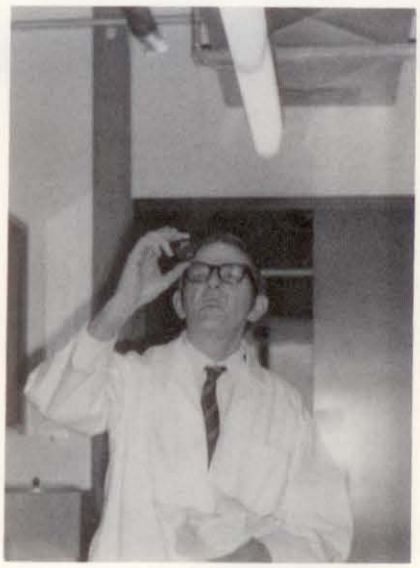
TO

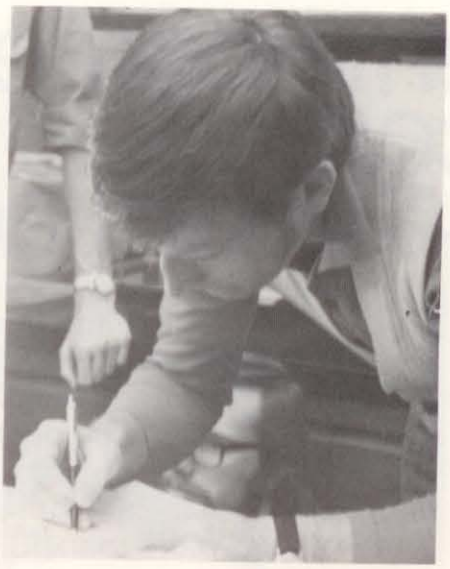
DR. M. BARTLEY - HONORARY PROFESSOR, LAKEHEAD UNIVERSITY

MRS. J. HELLIWELL - SECRETARY, GEOLOGY DEPARTMENT

MR. S. SPIVAK - DRAFTSMAN, GEOLOGY DEPARTMENT

MISS P. ZURKAN - LAB TECHNICIAN, GEOLOGY DEPARTMENT





environmental control- 40 years ago

One of the finest recreational parks in Northern Ontario is located between the old Hollinger mine and the adjoining town of Timmins, a Northern Ontario mining community of 30,000 people. When the Hollinger mine and Timmins were both young the park was a tailings dump in a shallow lake, unsightly and dusty.

More than 40 years ago—long before environmental control became a subject of public concern—the dump was converted into a public park, maintained by Hollinger. It provides facilities for baseball, soccer, track and field events, picnics, field days, concerts and other recreational activities.

When the Hollinger mine closed, the park was ceded to the town of Timmins, but it remains a symbol of Hollinger's long-held belief that a successful mining operation can and should enrich the lives of all Canadians. It also provides enduring evidence that the need for environmental control was accepted by Hollinger long before the subject became publicly popular.

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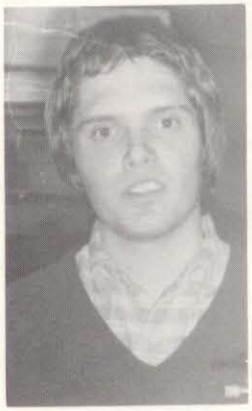
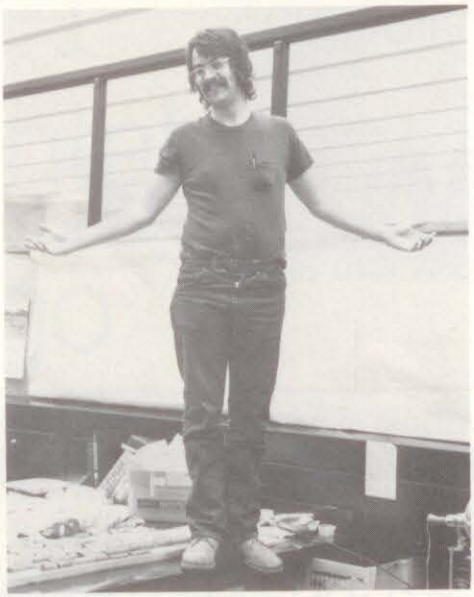

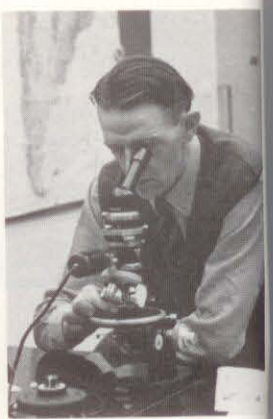

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EDITOR'S MESSAGE

This year book has been approximately three years in the making. During that time people have come and gone. Due to this turnover there have been many changes made, both in material and year book staff. When I and a few other concerned students took over, what faced us was an unorganized attempt of putting together a Year Book. We have attempted to put what pieces we had into some semblance of order. We have made no attempt to update the material to any great extent in order to finally get this year book done. Due to this many important details have been left out.

Thus I will give a brief resume of this material that was left out of the Year Book.

To begin with I will start with the faculty. In the winter of 1973/74 Dr. H. Loubat resigned his position at Lakehead and is now teaching in Quebec. Dr. Garth Platt was hired to fill this vacancy in the fall of 1974.

This spring Dr. Jim Franklin was offered a position with the Geological Survey of Canada which he has accepted. My only comment here is that L.U. Geology has lost one of its finest members.

Listed below are the names of all the Geology students from 1974/75. I am sorry that no pictures of many of these students are available and my apologies for this failing on the part of the past year book staffs.

FIRST YEAR

Herb Christmas
Brian Cole
Douglas Cole
James Crinklaw
Ernest Grach
Randy Hall
Elizabeth Johnston
Alan Koskela
Fred Peters
Jeffrey Record
Jean Samson
Bernard Schnieders
Frank Seeliger
Mark Wittrup
Gordon Yule

SECOND YEAR

Alan Aubut
Frank Balint
Kenneth Hartviksen
Stephen Hitchman
Eric Mosley
Donald Nicol
Keith Peden
Randy St. Jacques
Ronald Tapsay
Donald Turubchuk
Gerald Varteniuk

THIRD YEAR

John Biczok
Heather Boyle
George Chabot
Albert Chiew
William French
Holly Johnston
William McLellan
Gerald Perry
Frank Smit

The following is the names of the students in the FOURTH YEAR - HONORS DEGREE for 1974/75 and also their thesis titles.

DENIS BATTRUM - Sedimentology of the Kama Hill formation of the Sibley Group.

JACK CLUE - The formation of stream ripples.

GARY GRABOWSKI - Geology of the Atikokan iron mine.

WILLIAM HODGINS - Selenium absorption of MnO_2.

DENNIS KWIATKOWSKI - Geology and geochemistry of anthraxolite.

DOUG LEHTO - Structural and petrological evolution of the Dog-Hawkeye Lakes area.

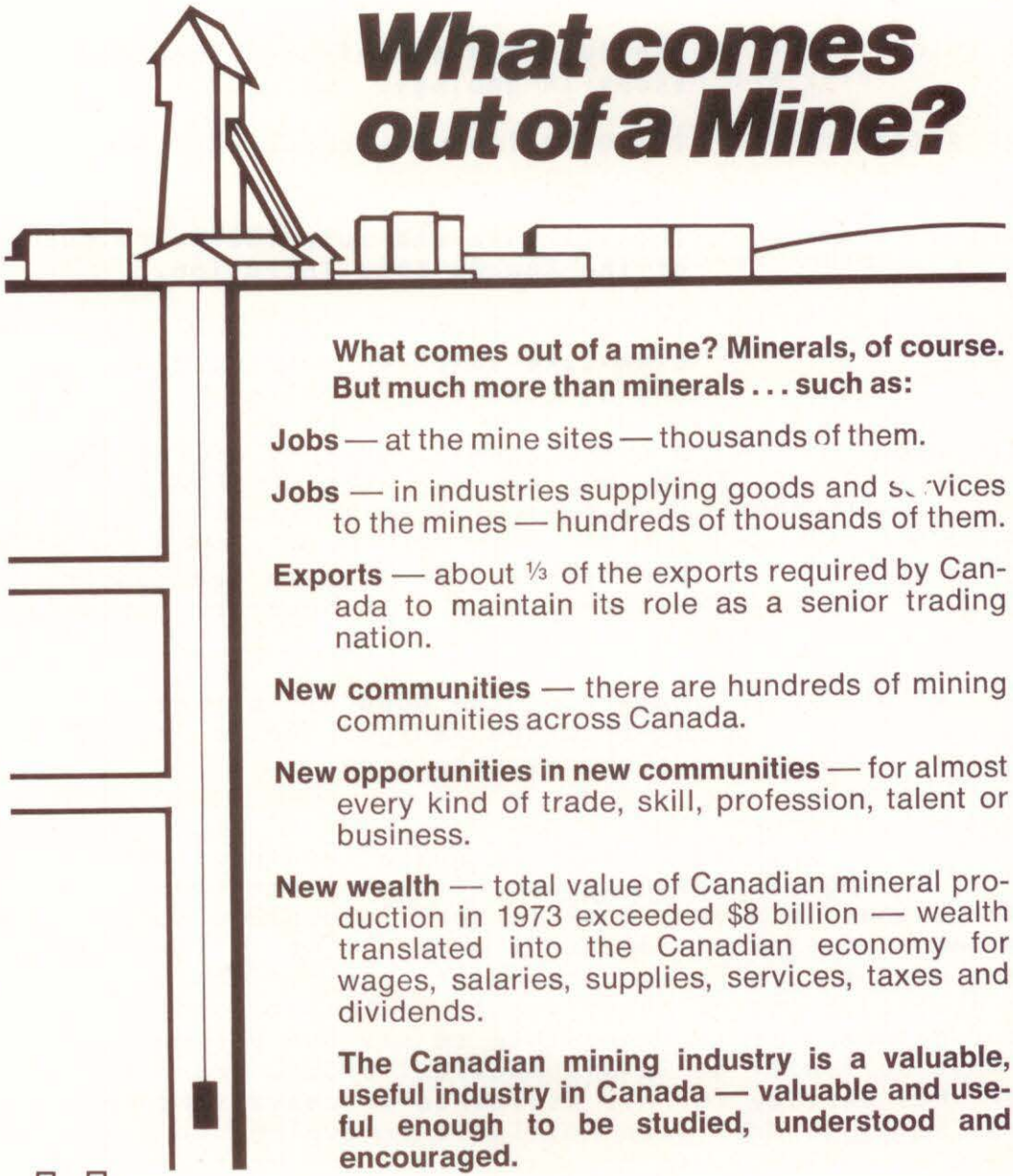
JOHN MASON	-	Quaternary sedimenology and stratigraphy of Thunder Bay.
WILLIAM MCRAE	-	Determination of cesium by neutron-activation analysis.
MARIO SILVA	-	Internal structure and petrology of the Trout Lake Intrusion.
GORDON STEINERT	-	Structure and petrology of the Barnum Lake quartz-monzonite.
JAMES SYVITSKI	-	Element concentration of the waters and sediments of Thunder Bay.

The next lists are the names plus thesis titles for those students that have graduated in 1973 and 1974, in that order.

1973 HONORS DEGREE

BRENT PASKE	-	Geology and geochemistry of the Onaman Lake Property, Northwestern Ontario.
GEORGE EINARSON	-	Variations in the style of Metamorphism in Archean Supracrustal Units of the Superior Province.
ROBERT KYRYLUK	-	Description of structures and their significance in a migmatite complex.
LESLIE TIHOR	-	Archean evolution of Western Dorion township.
ALLAN SPEED	-	The investigation into the use of gamma-ray spectrometry as a possible geologic mapping tool.
JOE KASARDA	-	Wall-rock alteration and trace element geochemistry of the footwall rocks of the Mattabi Deposit, Sturgeon Lake area.
NEIL CAMPLING	-	Some geological and environmental aspects of remnant pre-Gunflint and pre-Sibley weathered profiles.

What comes out of a Mine?



What comes out of a mine? Minerals, of course. But much more than minerals . . . such as:

Jobs — at the mine sites — thousands of them.

Jobs — in industries supplying goods and services to the mines — hundreds of thousands of them.

Exports — about ⅓ of the exports required by Canada to maintain its role as a senior trading nation.

New communities — there are hundreds of mining communities across Canada.

New opportunities in new communities — for almost every kind of trade, skill, profession, talent or business.

New wealth — total value of Canadian mineral production in 1973 exceeded $8 billion — wealth translated into the Canadian economy for wages, salaries, supplies, services, taxes and dividends.

The Canadian mining industry is a valuable, useful industry in Canada — valuable and useful enough to be studied, understood and encouraged.

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