Geological Survey of Canada
Commission géologique du Canada

MISCELLANEOUS REPORT 29

GUIDE TO AUTHORS

1980

Canada

Miscellaneous Report 29

GUIDE TO AUTHORS - A Guide for the Preparation of Geological Maps and Reports

compiled by

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1980

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INTRODUCTION

The principal aims of the Geological Survey of Canada are to supply the geoscience information necessary to assist in the discovery and evaluation of our mineral and energy resources and to study the Canadian landmass in order to identify potential hazards and the problems that may arise during resource development. Some results are of interest to a limited audience but most of the information collected by the Geological Survey is of much wider application. Our publication program is designed to disseminate results quickly and widely but the success of such a program depends on the quality of the reports prepared by individual scientists. The "Guide to Authors" is designed to assist authors in preparing a clear, concise manuscript that will be printed and published with a minimum of delay and difficulty.

Some scientists desire strict guidelines for the preparation of reports. This, to some extent, simplifies their task but removes most traces of individuality. Others wonder why editors, style manuals, and all the paraphernalia associated with publication are needed at all. The reports prepared by such free-spirits quickly answer the question.

The style of presentation and the physical form of Survey reports has changed considerably in the past two decades. In part this reflects the major revolution in the printing trade -- the move from hot type to photo-offset printing and the spread of word-processing equipment from the plant to the office. Copy from which printing plates can be made can now be produced in the Geological Survey offices and can thus reflect more closely our needs.

The changes also reflect the changing role of the Survey. Regional mapping, although it remains a fundamental activity, now represents a smaller part of the Branch program and fewer memoirs are now published than a decade ago. A major thrust in energy resource assessment -- the Uranium Reconnaissance Program -- has resulted in the collection of what can only be termed "vast" amounts of data. As quick public access to this information is desirable, means of publication other than the classical hardcopy report are being developed. Most of the results of the URP and similar programs are released as microfiche. Terrain studies carried out as part of evaluations of possible transportation corridors in the North have resulted in the compilation of hundreds of maps, the production of which using classical methods could far exceed the Survey's cartographic capability. By judicious planning early in the compilation stage it is proving possible to use much of the drafting done by the geologist, thus avoiding many weeks of duplicate cartographic work. The guidelines in this book reflect these and other changes.

English grammar has remained relatively unchanged since the Middle Ages but if you have tried to read Chaucer in the original or even Elizabethan authors you will probably have been faced with words that appeared unintelligible until you tried reading aloud. Grammar remains constant but spelling evolves, sometimes rapidly. There are numerous English words for which no "right" way for spelling exists. Even if the decision is made to use "Oxford" as opposed to "Webster" exceptions still arise. The usage applied by the Geological Survey is the way we do things -- it is neither right nor wrong. This edition of the "Guide" includes changes in spelling particularly in compound words. Some may appear capricious. It may seem that no rules are being followed: why lakeshore but lake basin? seafloor but sea level? The editors of this edition of the "Guide" have tried to reconcile the common usage found for example in newspapers and magazines with specialized geological applications. More time was spent revising the section on spelling than on any other section. The suggestions are not always in accord with the AGI Glossary of Geology because some spellings of compound words in the Glossary appear out-of-step with current popular usage.

R.G. Blackadar
Chief Scientific Editor

Ottawa, December 1978

PUBLICATIONS ISSUED BY THE GEOLOGICAL SURVEY

The Geological Survey of Canada is not only concerned with scientific research but is also directly involved with providing the geoscience data needed for short-term planning and for making policy decisions on such critical subjects as nonrenewable energy resources, transportation corridors, or strategic mineral resources. Because almost all the results of GSC studies should be equally available to all Canadians as nearly as possible at the same time, a variety of publication modes are used to meet these diverse objectives. They range from the classic scientific treatise which presents results acknowledged by the scientific community to be major contributions, to interim data maps and reports released in limited editions using the facilities of commercial reproduction organizations.

Memoirs

Comprehensive terminal reports on the geology of specific areas.

Bulletins

Comprehensive reports on geological or related subjects, not primarily on systematic areal mapping. May be of any length but are generally terminal reports on at least some phase of a research project. May be illustrated in any manner suited to the subject.

Economic Geology Reports

Economic Geology reports include reports on subjects of economic interest on a broad regional basis; examples are "Tungsten in Canada" and "Prospecting in Canada".

Miscellaneous Reports

Include popular guides designed mainly for the use of the general public, and publications not readily assigned to other categories.

Papers (excluding "Current Research")

These are produced by photo-offset printing from copy prepared by the word-processing unit of the Secretarial Services section. Like all other reports those issued in this series have undergone critical review by one or more specialists. They may be final to the extent that the author does not anticipate further work. They may include maps, figures, and pocket items. They differ from bulletins primarily in that they *may* comprise interim results.

Papers (Current Research)

This publication constitutes the Geological Survey's "Report of Progress" and is currently (1978) issued three times a year. It is made up of three sections: Scientific and Technical Reports, Scientific and Technical Notes, and Discussions and Communications. Contributions to the first section should not exceed 5000 words; contributions to the other sections should be considerably shorter. Illustrations for "Current Research" usually are prepared by the author for direct reproduction. Contributions to this publication, especially to the first section, are subject to the same critical review as is given to other GSC manuscripts.

Maps

"A series" multicoloured maps. These present an author's considered conclusions on the geology of an area. They are sometimes referred to as "final" maps.

Other maps. The Geological Survey issues a wide variety of maps on which interim information is presented. The most informal are those accompanying Open File releases; the author's hand-drawn manuscript may be used with little or no input from the professional drafting staff. The most formal are those which, except for the use of multicoloured map units, closely resemble "A series". In order to present data best, several colours may be used: blue for drainage, black or grey for topographic features and geological boundaries and symbols, and another colour if certain geological features require emphasis. A general guide for the use of colour in all except "A series" maps is: *coloured lines but not coloured areas.*

Open File

Many reports that are being prepared for publication are first placed on Open File. Increasing use is being made of microforms for the release of voluminous numerical data or for the release of the maps resulting from multiparameter geophysical and geochemical surveys. For most items master copies are deposited with commercial firms in several Canadian cities, and duplicates are made in response to user demand.

THE PUBLICATION PROCESS

Acceptance of a manuscript by a division following agreement between author and critical reader marks the first step towards publication.

The manuscript, together with the critical reader's comments is forwarded by the division to the office of the Chief Scientific Editor. Following editing, including where necessary discussion with the author, it is forwarded to the Production Editor's office where the cartographic items are checked and sent for drafting.

If the report is to be printed using copy prepared at the GSC the production editors prepare the layout and liaise with the typists in the word-processing unit who prepare the typescript used to produce the printing plates. The edited manuscript is typed onto magnetic tape and played back to give proofreader's copy. Changes noted by the proofreaders are made and the final playback is made. A reduced photocopy is made of this and is sent to the author for his final approval. Except in unusual circumstances, changes, other than correcting errors, are not permitted.

The final typescript, figures, and photographs are forwarded to the printer where a 22% reduction is made in page size. This imparts a clean, close and visually attractive appearance. The metal printing plates are made photographically from the reduced copy. A set of "blue" proofs is made from these plates, and these proofs are checked for clarity by the Production Editor. As the printing plates are made from the same material as that previously checked by the author, there is no need for the "blues" to be checked by him. They are designed to ensure quality control. Following acceptance of the "blues" the printer makes the press-run, the pages are bound, and the covers added. If pocket items are involved they are added at this stage. Pocket items are printed and folded separately and delivered to the printer when required. The completed job is delivered to the Geological Survey offices and the Department of Supply and Services for distribution.

Reports that are to be printed using phototypesetting techniques follow a different route. While drafting is underway the scientifically edited manuscript is sent to the departmental editors where it is rigorously edited and marked for the printer. The author of course is consulted during the editing process. The edited copy, together with all page-sized illustrations, is sent to a printer where typesetting is done and the first proofs, the galleys, are prepared. Copies of these are returned to the departmental editors for proofreading and are sent to the author for approval. Minor changes may be made at this stage. A second set of proofs, the page proofs, are made from the corrected galleys and copies of these also are returned. If an index is required it will be prepared from a copy of the page proofs. Changes at this stage are costly and are made only if absolutely necessary. The corrected proofs are returned to the printer who makes any corrections then makes the plates and runs off a final proof, the make-up copy, which is checked by the departmental editors only. Following acceptance of this proof, the press-run is authorized.

HOW TO PREPARE A MANUSCRIPT GEOLOGICAL MAP

Field Maps

Base maps for field compilation are supplied by the Cartographic Section usually at the standard scales of 1:50 000, 1:100 000, 1:250 000, etc., although for special purposes they may be rescaled to facilitate field work. All base maps are prepared from current NTS or other master negatives and can be screened using selective negatives to meet authors' needs. The final product is normally a stable base matte film positive (sepia, cronaflex, etc.). Duplicate copies of master negatives used in the base preparation are filed in the Cartography Section for future use in final map preparation.

It is important that sufficient lead-time be allowed prior to the start of field work for Cartography to obtain loans of Surveys and Mapping Branch master negatives and do the necessary preparation and final photo-mechanical processing and delivery -- usually 2 and 3 months. This time frame should be lengthened where special requirements make it necessary to prepare new projections, mosaics, or where there are other complex requirements.

Since needs vary, the cartographic staff should be consulted if there are any unusual aspects to field base map requirements. Authors should keep in mind the publishing scale when plotting field data on enlarged sheets to ensure that detail will be readable at reduced publication scales; this will avoid major recompilation and generalization.

Final Manuscript Map

Base map positives for final compilation and submission for publication will be provided at publishing scale from negatives being held in Cartography (unless in the interim a more update version has become available; this will be discussed with the author). *Only black ink line work, symbols, and patterns should be plotted on the base matte surface positive. Reference letters, legends, etc., should be neatly hand lettered in black ink on a separate matte surface positive overlay.* This applies to all map series.

Figure 1. Geological timetable and age symbols.

EON		ERA		PERIOD		EPOCH	
Phanerozoic		Cenozoic	C	Quaternary	Q	Recent	R
						Pleistocene	P
				Tertiary	T	Pliocene	P
						Miocene	M
						Oligocene	O
						Eocene	E
						Paleocene	P
				Neogene	N		
				Paleogene	P		
		Mesozoic	M	Cretaceous	K		
				Jurassic	J		
				Triassic	T		
		Paleozoic	P	Permian	P		
				Pennsylvanian	P		
				Mississippian	M		
				Carboniferous	C		
				Devonian	D		
				Silurian	S		
				Ordovician	O		
				Cambrian	C		

Precambrian

EON		ERA		SUBERA	
Proterozoic	P	Hadrynian	H		
		Helikian	H	Neohelikian	N
				Paleohelikian	P
		Aphebian	A		
Archean	A				

Figure 2. Legend for bedrock geological map.

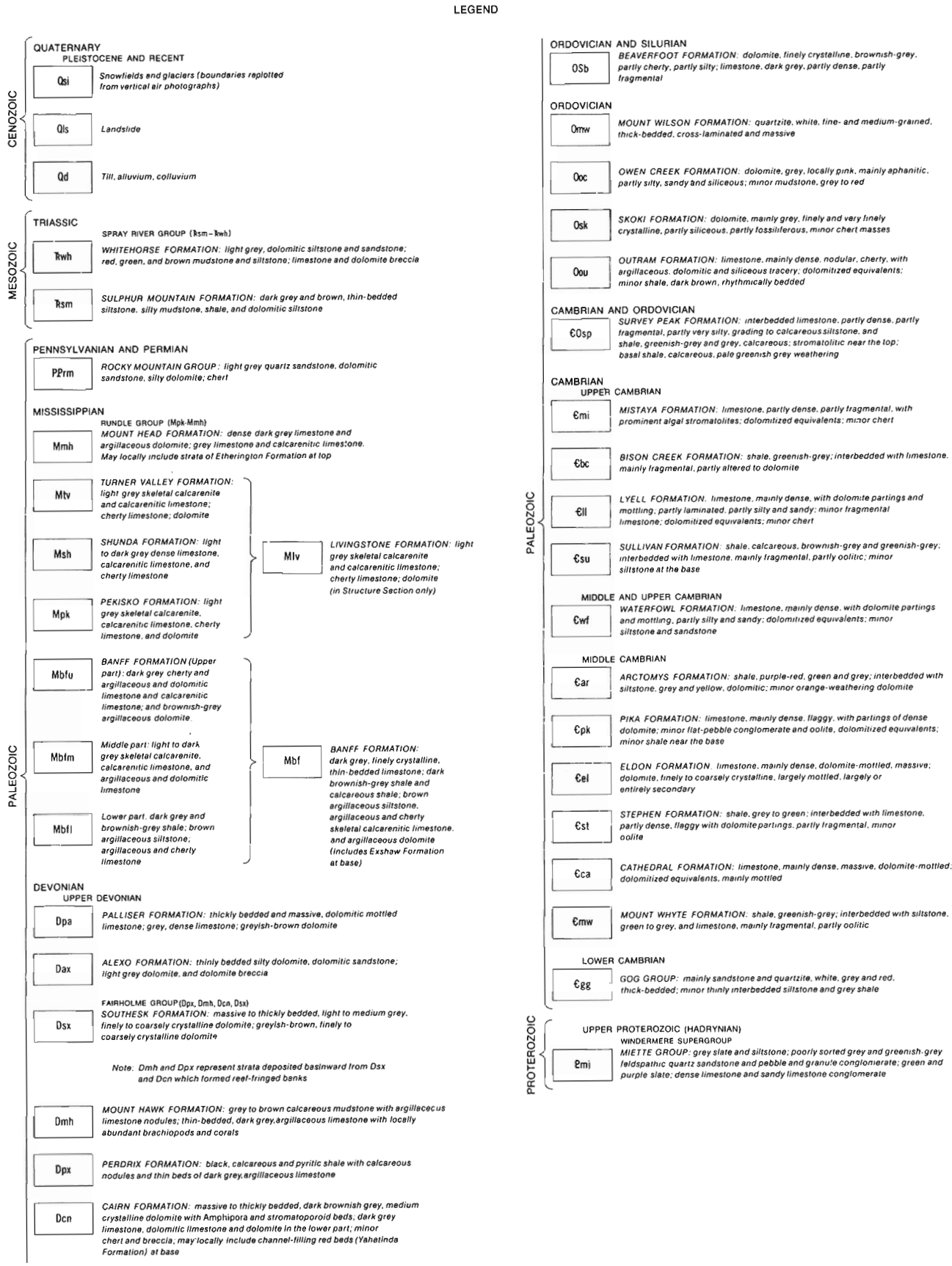


Figure 3. Legend for surficial geology map.

LEGEND

RECENT DEPOSITS

10	*ORGANIC DEPOSITS: mainly muck and peat in bogs and poorly drained areas*
9	*MODERN RIVER DEPOSITS: stratified sand, silty sand, silt, and disseminated organic matter on flood plain of present rivers*

POST-CHAMPLAIN-SEA DEPOSITS

8 | 7	*ABANDONED RIVER CHANNEL DEPOSITS: 8. Silt and silty clay; commonly including lenses of sand and generally underlain at variable depth by unit 3. 7. Stratified, buff, medium grained sand; unfossiliferous; locally reworked into low dunes*
6	*ESTUARINE AND CHANNEL DEPOSITS: stratified, buff to grey, medium to fine grained sand; minor gravel lenses; unfossiliferous; commonly reworked into dunes*

CHAMPLAIN SEA DEPOSITS

5	*LITTORAL FACIES: gravel, coarse sand, and cobbles; containing fossils; in places composed of slabs of bedrock where beach was derived from outcrops of Paleozoic rock. (Beaches underlain by fluvioglacial deposits are mapped as unit 2)*
4	*SUB-LITTORAL FACIES: uniform, fine, buff sand deposited in shallow water as nearshore facies; commonly reworked into dunes; commonly fossiliferous*
3	*DEEP WATER FACIES: blue-grey clay, silt, and silty clay; calcareous and fossiliferous at depth; commonly reworked; non-calcareous and non-fossiliferous at surface (0-2m) particularly in northeastern part of area*

PRE-CHAMPLAIN SEA DEPOSITS

2	*FLUVIOGLACIAL DEPOSITS: gravel and sand, stratified, some till; in the form of eskers and various ice-contact deposits; surface reworked into beaches in locations below the Champlain Sea marine limit*
1	*GLACIAL DEPOSITS: till; heterogeneous mixture of material ranging from clay to large boulders, generally sandy, grades downwards into unmodified till; surface generally modified by wave or river action; topography flat to hummocky*

BEDROCK

R	*Limestone, dolomite, locally shale, sandstone (Paleozoic); mainly bare, tabular outcrops; includes areas thinly veneered by unconsolidated sediments up to 2 m. thick*
R	*Intrusive and metamorphic rocks (Precambrian); mainly bare, hummocky, rolling or hilly rock knob upland; includes areas thinly veneered by unconsolidated sediments up to 2 m thick*

Drumlin, indicating orientation and approximate length

Crest lines of sand dunes

Fluvial terrace scarp

Structural scarp in rock

Landslide areas; includes zones of both material removal and redeposition L

Figure 4. Legend for surficial geology map.

LEGEND

Ap — *MODERN ALLUVIUM gravel sand. minor silt. at or near present stream level*

At — *TERRACE DEPOSITS gravel sand, minor silt*

E — *EOLIAN SAND mostly dating from early postglacial time and now fixed by vegetation*

S — *STEEP SLOPES eroding bluffs*

A_p^G — *FLUVIOGLACIAL DEPOSITS sand. largely deltaic and in the form of an apron*

A_h^G $_gA_p^G$ — *FLUVIOGLACIAL DEPOSITS: gravel and sand;* A_h^G *kames;* $_gA_p^G$ *spillway floor deposits*

L_p^G — *GLACIOLACUSTRINE DEPOSITS clay silt, minor sand and shoreline gravel; material generally more than 6 feet thick*

L_v^G — *GLACIOLACUSTRINE DEPOSITS: silt and stony silty clay; generally less than 6 feet thick*

Mp Mv — *GLACIAL DEPOSITS till and stony silty clay. locally including thin and patchy cover of lacustrine material; deposit of the last glaciation; Mp.-thick Mv.-thin (thickness on section locally exaggerated for purposes of printing)*

INTERGLACIAL ALLUVIUM: mostly gravel (on section only)

Bedrock (on section only)

a | b — *VALLEY FILL: gravel, sand. silt. clay. stony clay generally underlying glaciolacustrine deposits and/or till.*
a. *dating from last interglaciation.*
b. *dating from penultimate interglaciation*

Occurrence of erratic material:
derived from eastern sources . . . . . E *western sources* . . . . . W

Geological boundary (position defined approximate assumed).

Fluted and drumlinized (well defined poorly defined)

Hummocky terrain

Kame topography

Mapped shoreline

Meltwater channel

Dune topography

Landslide topography

Incipient landslide topography

Gravel pit

GRAVEL PITS

1. Ostero pit	5. Burr pit	9. Unnamed	13. Inga pit
2. Halfway pits	6. McLean pit	10. Cameron River pit	14. Doig River pit
3. Blair pit	7. Imperial pit	11. Cameron River pit	15. Milligan Creek pit
4. Howe pit	8. Thomas (?)	12. Rose Prairie pit	16. Upper Beatton River pits

Geology by W.H. Mathews. 1950. 1952. 1971. 1972

To accompany Paper 76-20 by W.H. Mathews

Geological cartography by F.S. Yeager and D.G. Brown Geological Survey of Canada

Any revisions or additional geological information known to the user would be welcomed by the Geological Survey of Canada

Base-map at the same scale published by the Surveys and Mapping Branch in 1962

Copies of the topographical edition of this map may be obtained from the Canada Map Office Department of Energy. Mines and Resources Ottawa

Mean magnetic declination 1977. 27°39' East decreasing 5.2' annually. Readings vary from 26°56' in the SE corner to 28°20' in the NW corner of the map-area

Elevations in feet above mean sea-level

Figure 5. Principal symbols for surficial geological maps and figures.

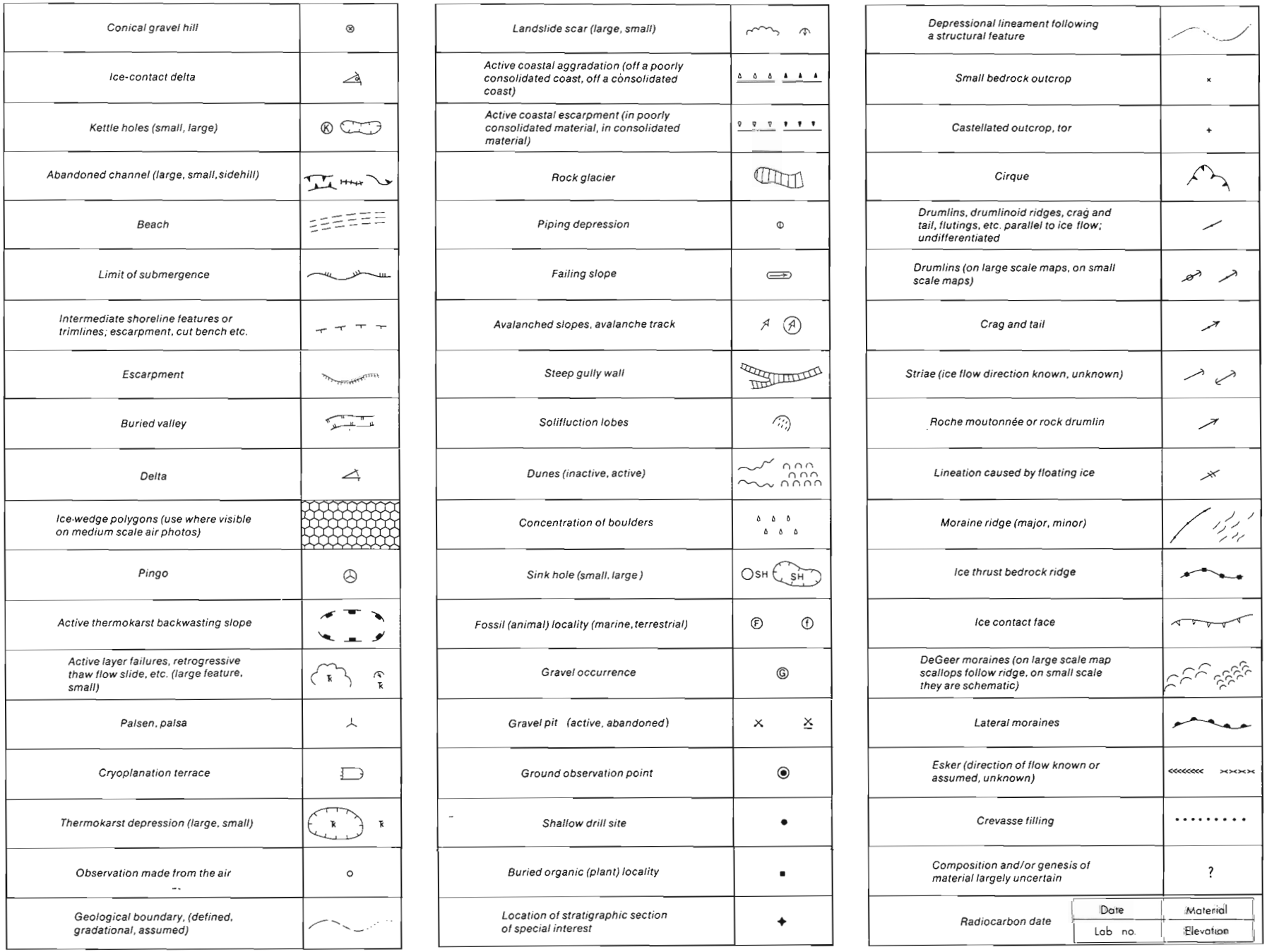
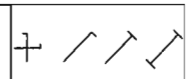
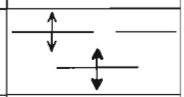
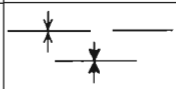
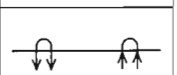
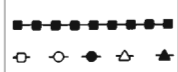


Figure 6. Principal symbols for bedrock geological maps and figures.

GEOLOGICAL FEATURES	SYMBOL
Drift-covered area	
Rock outcrop, area of outcrop, probable outcrop, float, frost heaved rock	
Geological boundary (defined, approximate, assumed)	
Geological boundary (gradational, inferred or metamorphic)	
Limit of geological mapping	
Limit of area surveyed with aircraft	
Flow contact	
Bedding, tops known (horizontal, inclined, vertical, overturned, dip unknown)	90
Bedding, tops unknown (inclined, vertical, dip unknown)	
Bedding, general trend (dip unknown, top unknown; dip and top known; dip known, top unknown)	
Bedding, estimated dip (gentle, moderate, steep)	g, m, s
Primary flow structures in igneous rock (horizontal, inclined, vertical, dip unknown) If a supplementary symbol is needed use	
Schistosity, gneissosity, cleavage, foliation (horizontal, inclined, vertical, dip unknown) Second generation (horizontal, inclined, vert)	
Schistosity, gneissosity, cleavage, foliation, general trend	
Gneissosity, cleavage, foliation (horizontal, inclined, vertical, dip unknown)	
Foliation (horizontal, inclined, vertical, dip unknown)	
Banding (inclined, vertical, dip unknown)	
Axial plane of minor fold (horizontal, inclined, vertical, dip unknown)	

GEOLOGICAL FEATURES	SYMBOL
Lineation (horizontal, inclined, inclined but plunge unknown, vertical)	30
Layering (in intrusive rocks)	
Lineation, axes of minor folds (horizontal, inclined, vertical)	
Drag-fold (arrow indicates plunge) Drag-fold in gneissosity	
Minor fold (arrow indicates plunge)	
Multiple fold (arrow indicates plunge, inclination of axial plane known, unknown) Multiple fold (plunge unkown)	25 15
Structural trend (from air photographs)	
Lineament (from air photographs)	
Fault (defined, approximate, assumed)	
Fault (inclined, vertical)	
Fault (solid circle indicates downthrow side, arrows indicate relative movement)	
Thrust fault (teeth in direction of dip; defined) (teeth indicate upthrust side)	
Thrust fault (approximate, assumed)	
Fault zone, shear zone; schist zone (width indicated)	
Shearing and dip	
Vein fault (defined, assumed)	
Mineralized bed or seam (hematite)	hem hem
Dyke, vein, or stockwork (defined, approximate, assumed)	

Figure 6. (cont.)

Joint (horizontal, inclined, vertical, dip unknown)		*Trench* *Open cut; axial*	
Anticline (defined, approximate) *Antiform*		*Borehole*	● BH ● BH2
Syncline (defined, approximate) *Synform*		*Diamond-drill hole* *Surface projection of geology inferred*	● DDH —○
Anticline and syncline (overturned)		*Gossan*	
Anticline or syncline (arrow indicates plunge)		*Show of oil and gas (abandoned)*	
Antiform or synform		*Show of gas (abandoned)*	
Locality where age has been determined, in millions of years	Ⓐ 1400	*Show of oil (abandoned)*	
Location of measured section		*Gas producer*	
Rock dump or tailings		*Oil producer*	●
Quarry or mine; rock trench and stripped area *Quarry or mine (abandoned)*		*Location of drilling*	○
Mine or mineral prospect (lead, zinc)	⚒ Pb Zn	*Dry (abandoned)*	
Mineral prospect, mineral occurrence (manganese)	✕3 ✕Mn	*Shaft, raise, winze* *Shaft (abandoned)*	
Mineral isograd *Other alternatives when more than one*			

A white print(s) or matte positive composite of the above will be provided for preparation of a colour copy guide. Sharp contrasting colours should be used and if possible they should approximate the GSC map colour chart selections. Corrections or omissions found at this stage should be indicated on the colour copy, the positive manuscript, and the overlay.

The final package submitted by the author to Cartography for publication should contain:

1. the base positive with contacts, symbols, etc.;
2. the positive overlay with reference letters, legend, notes, author(s), dates, etc.;
3. paper or matte film colour copy;
4. any additional information or instruction.

Incomplete packages will be returned to the author or held in Cartography until the additional material or information is received. While incomplete jobs will not be put into production, corrections and alterations and omissions which reflect more recent options or new information will be accepted up to the first colour proof stage which is the author's final check of his work.

How to Expedite Production

The following specific points are mentioned since they are the most common causes of production delays:

1. Indicate clearly the various classes of geological boundaries and faults (defined, approximate, assumed).
2. Each separate area of a geological unit should be identified to conform to the legend. Do not rely on the colour. Large areas should be identified in several places.
3. Geological contacts at the margins of the map sheet should be made to conform with those of adjacent sheets, as far as is consistent with more recent opinions.
4. Legends should be clearly marked as to ERA, PERIOD; GROUP, FORMATION, etc.
5. The year or years of the field work should be included as this forms an essential part of the legend.
6. Various symbols used should conform to accepted GSC specifications whenever possible.
7. All geographical names used in an accompanying text should appear on the manuscript map; those not already on the map should be added in red.
8. Names, other than those already adopted, must be submitted through the Superintendent of Cartography to the Canadian Permanent Committee on Geographical Names.
9. Do not submit as map manuscript a paper copy of a published map to which geological information has been added. *This is not acceptable* because of possible scale changes.
10. No cartographic work will be undertaken until authorized by division director and by Chief Scientific Editor. Scientific staff are not to submit material directly to the cartographic units; all material must be submitted through your Division Director.

The Cartography Section is prepared to advise and, to a limited extent, assist geologists preparing figures for reproduction in outside publications. If advice is secured at the start it will ensure the use of the simplest and most effective method for the type of reproduction anticipated.

JOINT AUTHORSHIP, ACKNOWLEDGMENT OF CREDIT AND CRITICAL REVIEW

More than one person may be concerned, in one way or another, with the preparation of a report. It is important to know precisely who wrote what. Acknowledgment of scientific assistance is not merely a matter of giving due credit but is an assignment of responsibility for accuracy and veracity of statements.

Joint Authorship

The following points should be observed.

1. *Full Joint Authorship.* Each author named should have made a major and equitable contribution both to the research and to the writing of the report. Names are usually arranged alphabetically.

   Cited: Jones, J.G. and Smith, L.B.
   1968: Geology of Baffin Island; Geological Survey of Canada, Memoir 487, 300 p.

   Common sense must play a role if there are many joint authors. To list all the contributors to a volume such as "Contributions to Canadian Paleontology" on the cover is unsatisfactory from an aesthetic point of view and creates a nightmare for library cataloguers and for others who wish to cite the work. These are cases where no authorship should be assigned to the report as a whole but each section should be cited as: Jones, J.G. and Smith, L.B. in Geological Survey of Canada, Bulletin 450, p. 6-21.

2. *Contributed Authorship.* The senior author is normally the leader of a project and has had a major responsibility in assembling the text. In other cases senior authorship must be decided by mutual agreement.

   a) There are cases where there is only one senior author but where the contributions of colleagues warrant inclusion in the title. For example: Staff members commonly wish to acknowledge the contribution of student assistants to "Current Research" reports.

   Ridler, R.H.
   Regional metallogenic and volcanic stratigraphy of the Superior Province (with contributions by L.A. Tihor, J.H. Crocket and J.H. Foster); in Report of Activities, Part A, Geological Survey of Canada, Paper 75-1A, p. 353-358.

   The individual contribution would be cited as follows:

   Tihor, L.A. and Crocket, J.H.
   Gold distribution and gamma-ray spectrometry in the Kirkland Lake-Larder Lake gold camp; in Ridler, R.H., Regional metallogenic and volcánic stratigraphy of the Superior Province; Report of Activities, Part A, Geological Survey of Canada, Paper 75-1A, p. 355-357.

3. *Supporting Contributions.* Provided by scientific staff to support the main research project but which may comprise data or interpreted results of usable value in a broader context. Would include age determinations, rock or mineral analyses, fossil determinations, paleomagnetic contributions, etc. Where possible this information should be grouped together in tabular form or as an appendix, preferably as a separate item at the end of the report under the name of the scientist(s) responsible so that it may be cited in other publications as under (2). References in the text of the report can then be made to the appendix.

   Where this is not possible and where such contributions are scattered through the text then there should be proper acknowledgment in each case – e.g. "These rocks were studied by E.J. Jones of the Geological Survey who reported as follows:..."

   Tables of analytical or other data should clearly state where the work was done, with the analyst's name (if applicable) and the method used.

   The inside title page rather than the cover of a report is the place to explain more fully the participation of other agencies or contributions such as in 2.

Critical Review of Manuscripts

Critical review plays an essential role in maintaining the quality of GSC reports and is also of increasing importance in the face of continuing demands to evaluate and monitor the effectiveness of research programs.

All scientists of the Geological Survey must expect to be assigned manuscripts for critical review as a normal part of their duties and must also expect their manuscripts to be subject to critical review. The names of the critical readers are listed in each publication but this procedure is not followed for reports published in "Current Research" due to the brevity of most contributions. However acknowledgment should be made to them in the body of the text.

The critical reviewer should have no hesitation in questioning the value of any illustration or in commenting on any apparent wordiness. Depending on complexity, drafting may be a time-consuming procedure and may delay publication. By the time the report reaches the editorial stage such surgery is costly in time and effort to both editor and author.

No manuscript should be submitted for critical review until the author considers it complete. Formal critical review does not take the place of peer discussion which may generate new ideas and new material. Critical appraisal cannot be made on the basis of an incomplete manuscript.

A critical reviewer is not a "ghost writer" and no author should expect his report to be rewritten for him.

Guidelines for Critical Reviewers

a) Assignment of critical reviewers is the responsibility of the Division Director, although he may delegate this duty. He must ensure that the manuscript is in its final draft form, including clear, unambiguous illustrations *and that it contains a clear statement of how the report meets the project objectives and how it contributes to the mission of the Survey.* The critical reviewer must also submit a brief, written evaluation of the report.

b) It is the responsibility of both the author and critical reviewer to ensure that the factual information is presented clearly and concisely in such a manner that the reader will have no doubt as to the authenticity and accuracy of the factual information presented. Authors and critical reviewers may disagree on the conclusions that may be drawn from the factual information presented, but there should be no disagreement as to the facts themselves.

c) The Geological Survey, as an organization, does not possess or maintain a particular posture regarding geological concepts. The Geological Survey can only reflect the collective wisdom of its past and present scientific staff in consideration of the available facts and in consideration of the evolution in geological concepts occasioned by the discovery of new information. All scientists of the Geological Survey, however, are identified by the scientific community as part of the Geological Survey thus statements made in approved Geological Survey publications reflect directly upon the Geological Survey. Authors are entitled to present in their manuscript new hypotheses and/or variations in previously accepted points of view. Critical reviewers must ensure that such hypotheses are based on the factual information contained in the manuscript. If the factual information lends itself to more than one interpretation, such alternative interpretations should be presented. The author is entitled to state his preference among multiple working hypotheses, but he must also be prepared to state the basis for his preference.

   Critical reviewers have a responsibility to point out alternative hypotheses or points of view to authors where such are warranted. The critical review process, however, is not intended as the vehicle for "conversion" of an author or critical reviewer to a single point of view if more than one point of view may be reasonably entertained.

d) Where the required expertise is not available in the Branch, Division Directors may make use of outside critical readers.

e) Some of the major points that should be considered by the critical reader are:

   - Do the results presented warrant publication in the form proposed or would another mode of publication be more suitable?
   - Does the report provide any significant advances or does it comprise only confirmatory data and if so is it worth formal publication? Does it meet the objectives of the project?
   - Are all the tables and figures essential; could some be combined? Pocket items add to the cost and complexity of publishing and should be avoided whenever possible. The large format used by the GSC provides a wide scope for page size figures.
   - Has the author made use of material already presented in another publication; if so has this been referenced adequately? Could any parts of the report be considered as dual publication? Has the author given full credit to other authors whose data and conclusions have been used in his presentation?
   - Is the report too long? Is it padded? Should some of the supporting data be treated as an appendix, possibly as microfiche?
   - Does geophysical, geochemical, stratigraphic, geological, and biological terminology meet accepted standards?
   - Are measurements expressed in SI units wherever possible?
   - Do geographic or geological names which are referred to in the text and with which the reader may not be familiar, appear on one or more of the maps or illustrations?
   - Does your experience allow you to assess all aspects of the report or are there sections that should be reviewed by someone else?

f) All critical readers must, as part of their responsibility, submit a brief, written evaluation of the report to the division concerned. They should also forward their comments and the author's response to these to their Division Director for forwarding with the manuscript to the Chief Scientific Editor.

General Acknowledgments

These should be made collectively at one place in the report. Assistance rendered by persons not connected with the Geological Survey should be acknowledged with suitable expressions of restrained gratitude. As a convention, members of the Survey (or Department) are not thanked but where appropriate their contribution should be recorded in such matters as photographs or some particularly useful or ingenious piece of laboratory support.

It is unnecessary to mention general assistance by other members of the Survey; every investigation or report is assumed to have had the benefit of suggestions and discussion of the author's colleagues as a part of their routine work and such contributions need not be noted unless they have been of major proportions. The paeans of praise poured out under the heading of "General Acknowledgments" in some reports tend the reader to cynicism and are self-defeating.

THE METRIC SYSTEM

In 1971 the Metric Commission, established as a result of the 1970 White Paper on Metric Conversion in Canada, adopted the metric system in common use in most European countries, the Système International (SI). Since that time, SI units have been introduced gradually in the different areas of Canadian industry.

The Geological Survey has been using a natural scale for geological and aeromagnetic maps for some time. New and revised topographic maps published by Surveys and Mapping Branch use metric contours. All GSC publications now require the use of metric units. Measurements, therefore, should be recorded in SI units and not in British units with a later conversion to SI, because this conversion may introduce errors.

Situations undoubtedly will exist that require the use of British units (borehole data, etc.) but this should be minimal; in these cases, however, the SI equivalents should be cited where appropriate.

Using SI Units

There are seven base units in SI; however other units have evolved to complete the metric system.

Base Units

Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol
Luminous intensity	candela	cd

Other SI units

Frequency	Hertz	Hz
Pressure	Pascal	Pa
Electric resistance	ohm	Ω
Electric potential	volt	V

SI units in common use

Mass	kilogram	kg
	gram	g
	tonne	t
Length	kilometre	km
	centimetre	cm
	millimetre	mm
	micrometre	µm
Volume	cubic metre	m^3
	cubic centimetre	cm^3
Temperature	degree Celsius	°C

SI units in specialized fields

Magnetic field strength	Tesla	nT
Magnetic flux density Magnetic induction	Tesla	nT
Power	watt	W
Volume	litre	L
Temperature	degree Celsius	°C
Area	hectare	ha
	square metre	m^2
Pressure	kiloPascal	kPa
Time	minute	min
	hour	h
	year	a
	thousand years	ka
	million years	Ma
	billion years	Ga
Magnetization	Ampere/metre	KA/m
Grade of ore	grams/tonne	g/t

Multiplication and division of metric units. The product of two or more units are indicated by a dot which is raised above the line, if possible; for example: resistivity •Ω•m, moment of force N•m, or velocity $m.s^{-1}$.

To express a compound unit formed by division, a solidus (oblique stroke /), a horizontal line, or a negative power with a dot to indicate multiplication may be used: for example m/s, $\frac{m}{s}$, or $m.s^{-1}$, however a solidus must not be repeated in the same expression, such as m/s^2 but not m/s/s.

When the names of units are used, multiplication is indicated by a space and division by the word "per". For example, kilograms per square metre.

Prefixes in SI

giga	G	1 000 000 000	10^9
mega	M	1 000 000	10^6
kilo	k	1 000	10^3
hecto	h	100	10^2
deca	da	10	10
deci	d	0.1	10^{-1}
centi	c	0.01	10^{-2}
milli	m	0.001	10^{-3}
micro	u	0.000 001	10^{-6}
nano	n	0.000 000 001	10^{-9}

Some general rules in using the SI system

(1) The symbols are always in roman type.

(2) Symbols are never pluralized.

(3) A full stop is not used after a symbol, except to end a sentence.

(4) When a unit comprises letters, a full space is left between the number and symbol e.g. 45 kg, but a symbol directly follows a number, e.g. 32°C.

(5) Symbols for SI units should always be used; unit names should not be written out except in general terms such as "several metres west...".

(6) In North America a period or dot is used as the decimal marker whereas in Europe the comma is used.

(7) In numbers with many digits, the numbers are broken into readable blocks of three digits each starting from the right and left of the decimal point. However, no space is left in a four digit number except for uniformity when four digit numbers occur in tables.

(8) Where a decimal fraction is used, a zero should always be placed to the left of the decimal marker, e.g. 0.78 g.

Conversion. Conversion factors for common units are given. If values were not recorded originally in SI units, the equivalent must be given in parentheses.

1 inch	=	2.54 cm	1 pound	=	0.45 kg
1 foot	=	0.305 m	1 fluid ounce	=	28.4 mL
1 mile	=	1.6 km	1 ton (short 2000 lb.)	=	0.907 Mg
1 square inch	=	6.4516 cm^2	1 calorie	≃	4.18 J
1 square foot	=	0.0929 m^2	1 troy ounce	=	31.103 g
1 square mile	=	2.59 km^2	1 kilobar	=	10^5 kPa
1 acre	=	0.40469 ha	1 atmosphere	=	101.3 kPa
1 cubic foot	=	0.028 m^3	°F	=	1.8•°C + 32
1 ounce	=	28.3 g	°C	=	5/9 (°F – 32)

Units that should not be used with the SI

Quantity	Name	Symbol	Definition
length	angström	Å	1 Å = 0.1 nm
	micron	μ	1 μ = 1 μm
	dyne	dyn	1 dyn = 10 μN
pressure	torr	Torr	1 torr = $\frac{101\,325}{760}$ Pa
	kilobar	kbar	1 kbar = 1 x 10^5 kPa
energy	calorie	cal	1 cal = 4.1868J
	erg	erg	1 erg = 0.1 μj
viscosity dynamic	poise	P	1 P = 1 dyn•s/cm^2 = 0.1 Pa•s
kinematic	stokes	St	1 St = 1 cm^2/S
conductance	mho	mho	1 mho = 1 S
magnetic field strength	oersted	Oe	1 Oe ≃ $\frac{1000}{4\pi}$ A/m
magnetic flux	maxwell	Mx	1 Mx = 0.01 μWb
magnetic flux density	gauss	Gs.G	1 Gs = 0.1 mT
magnetic induction	gamma	γ	1 γ = 1 nT

WRITING A GEOLOGICAL REPORT

Unfortunately no person can tell another how to write a report. Guidance can be given and suggestions made but because writing is very much an expression of personality, the result imposing rigid guidelines is a factual but uninteresting report. A writer, however, should never forget that his main aim is information transfer; he believes that what he has found or deduced is worthy of a larger audience. To accomplish this aim requires above all conciseness and clarity. From the opening lines of the abstract to the concluding sentence of the summary these qualities should never be forgotten.

Scientific reports need not be stilted although they are not likely to rival a best selling novel. They must however be logical, and every successful report has been written around a clear and concise outline. This outline should be developed as soon as you decide to write your report. It enables you to identify the principal topics that you plan to cover, to see if their treatment will proceed logically, and to identify any gaps in your research. The outline, modified to some degree, will reappear later as the contents page.

Before beginning to write a report you should look at similar, previously published Geological Survey reports. It is advantageous for our reports to follow more or less uniform plans. This makes it easier for the reader to find his way around and assists the writer in presenting his material in an orderly sequence.

Manuscripts should be typed double-spaced on 21 by 27.5 cm paper. Do not submit a photocopy.

The usual format for the contents page is:

Abstract/Résumé
Introduction
  Acknowledgments
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References
Appendix
Tables
Maps
Figures
Plates

Chapters, sections, subsections, etc. are not numbered in Geological Survey reports unlike the procedure followed in some scientific journals.

The use of the first person is acceptable in Geological Survey reports. However, an excessively egotistical style can be avoided by judicious use of the passive. Rather than "I found that the solute was soluble at unusually low temperatures which led me to the conclusion....." write "The solution was found to be.....".

Indeed the passive is appropriate to scientific writing where what is discovered, proposed or postulated is commonly more important than the proposer.

Title

With the development of computerized information retrieval systems based on word and subject concepts, the need for explicit titles and headings which lend themselves to cross-referencing becomes of considerable importance. The title of the report should clearly state the nature and major discipline, the location and whenever possible a meaningful National Topographic System (NTS) reference number. Chapter headings and subheadings should cover all major concepts in the report. Computer indexers are not able to analyze the report in detail and must rely on the author for an abstract and headings within the report that provide a ready access to the main topics of the subject matter of the report.

Preface

A preface by the Director General is included in all Geological Survey Memoirs, Bulletins and Economic Geology Reports. A rough draft must be submitted by the author with the manuscript.

The principal purpose of the preface is to indicate the purpose of the study, how the report helps meet departmental objectives, and to indicate briefly the nature of the report. The preface is not an abstract. It also serves to give official approval to the report.

Abstract

Abstracts must be submitted with all Geological Survey manuscripts. They should be written in complete sentences and should have a maximum length of 250 words. A well written abstract should enable a reader to decide whether or not the entire document should be read. The abstract should state the purpose, methods, results and conclusions of the study. Abstracts of reports concerned with experimental work should list quantitative conclusions.

Abstracts will be translated into the other official language under Departmental auspices and the translation will be published with the report. Bilingual authors are urged to submit their abstracts in both languages to obviate possible misinterpretation by the translators.

Contents and Headings

The "Contents" page lists the principal headings of the report and concludes with a list of the illustrations. Normally headings lower than third or fourth order are not listed in the Table of Contents of the published report but the draft copy must show the relative importance of all headings used. This is most easily done by successive indentations.

General geology
  Northwest segment
    Mary Lake Group
      Sandstone unit
    Green Mountain Group
  Western segment

Titles for illustrations listed in the contents page should be one or two sentences long. The complete caption as used in the text need not be used in many cases.

Successive Chapters

The subject matter of most reports can be subdivided. The largest subdivision, the chapter, may be so designated formally and numbered but more often is simply a major heading.

Even if not formally designated "Introduction", it commonly proves useful to devote the opening paragraph of each major section to a brief statement of what the section contains.

The various parts of a report commonly pass from the general (Introduction, General Geology, etc.) to the specific and back to the general (Conclusions). Most parts of a report reflect conceptual links and care should be taken to ensure that the writing reflects these links.

Wherever possible avoid internal cross-references using page number. The correct number cannot be inserted until the page-proof stage (for typeset reports) or the final camera-ready typescript (for typed reports). There is always the chance that a number may be missed or that an incorrect number may be inserted.

Introduction. A clear statement of the project objectives and how the project contributes to the work of the Geological Survey should appear in the opening paragraph of the Introduction. The nature and scope of the study should be described briefly in the Introduction and acknowledgment should be made for assistance received. Other topics that are commonly presented in this section are the location and size of the area, access, economic significance of the area and physical features.

General Geology. Although the last decade has seen marked decrease in the number of reports concerned with Regional Geology (the classical Memoir) many reports still warrant a section devoted to this topic. Normally it is divided into three principal parts (1) General Statement, (2) Table of Formations, and (3) Description of Formations.

1) *General Statement.* This is usually brief, though in particular cases it may be expanded to advantage. Its principal purposes are first, to outline the regional geological setting and second to present in summary a picture of the local geology, with special emphasis on discoveries of outstanding interest. Details should be avoided and conclusions given without supporting evidence.

   The General Statement need not be indicated by a heading either in the text or the "Contents", as it appears under the heading General Geology, its purpose is obvious.

2) *Table of Formations.* Few features in the report require greater attention to detail than the Table of Formations, as few pages will be referred to more frequently for a tabular summary of the geology of the area. All rocks, whether mappable or not, should be included and arranged in their assumed stratigraphic positions. The nature of the contacts between successive rock units should be indicated, where possible, by such terms as unconformity, disconformity, intrusive contact, gradational contact, relations unknown etc. Four columns generally are employed: for era, period or epoch, the name of the formation, and lithology. Where thicknesses are known or have been estimated, these can be shown in the column containing the formation names.

   In preparing the Table of Formations the exact form, as shown in other recent memoirs, should be followed, including capitalization, punctuation, and indentations. The following are hypothetical examples. Tables of Formations are not given table or figure numbers.

3) *Description of Formations.* Formations[1] are described in order from oldest to youngest, and generally in the same order as on the map legend and in the Table of Formations. Sometimes, however, the sedimentary and volcanic rocks are described first, and the intrusive rocks are taken up in order on succeeding pages.

Proposed new stratigraphic names for use in Geological Survey publications or for use by Geological Survey officers must be cleared with the officer responsible for maintaining the Lexicon of Geological Names. In addition the Precambrian Subdivision has established a committee to rule on the acceptability of names proposed for structural and related features.

The Geological Survey follows most of the proposals of the *Code of Stratigraphic Nomenclature* of the American Commission on Stratigraphic Nomenclature. This was published by the American Association of Petroleum Geologists in 1970 and was reproduced as an Appendix to earlier editions of this publication. A recent reference text is *International Stratigraphic Guide* — A guide to stratigraphic, classification, terminology, and procedure; H.D. Hedberg, ed.; John Wiley and Sons; 1976; 200 p.

Bed by bed descriptions of stratigraphic sections are an important and necessary supporting part of some reports. Such descriptions, however, commonly are voluminous and current practice is to reproduce such data in microform from the author's original typescript. It is thus essential that described sections should be accurately and carefully prepared. Much editorial time has been wasted in the past in reorganizing rock unit description and in eliminating errors in thickness totals. Each unit or bed should be described in a logical manner with consistent punctuation as follows: major rock type, modifying adjectives, colour, grain size; bedding, other structures; minor constituents; mineralogical, textural, and other comments; weathering; relative aboundance of fossils:

Unit	Description	Thickness (m)	
		Unit	Total from base
	Medicine Formation (Silurian)		
8	Limestone, dolomitic, dark grey, medium grained; thick bedded to massive; scattered white chert nodules; weathers brown; abundant Stromatopora and occasional solitary corals. GSC loc. 27124.	22	275
	Unit 8 forms a prominent small cliff at the top of the first talus slope above treeline.		

Examples of described sections are to be found in Memoir 379 and Bulletin 270. Identified fossils should be listed by name under the description of the bed where they were found and the registered GSC locality number should be given.

All proposed new names for rock units must conform to approved principles of stratigraphic nomenclature (see Code of Stratigraphic Nomenclature; American Association of Petroleum Geologists, Tulsa, Okla., 1970).

References

This section follows the main body of text and may be entitled References, Selected Bibliography, or Bibliography depending upon its nature.

The term "References" is used when each publication in this section is referred to and cited at least once in the text.

The term "Selected Bibliography" is used when the author adds to the "References" some other publications related to the subject of the report.

The term "Bibliography" is used when the author has attempted to list all references bearing on the subject, in some cases even indirectly.

The Geological Survey uses the author — date system (e.g., Smith, 1973) in the text when referring a reader to the reference list in which the publications are listed in alphabetical order by author. When assembling the report, care should be taken to ensure that each reference cited in the text is included in the reference list and that reference is complete and accurate. The accuracy of the reference section is the responsibility of the author. Remember that inaccurate or misquoted references may reflect upon the quality of research and reliability of the report.

Only material that has been published or that is "in press" should be cited in the reference list. Material of limited circulation (technical reports, theses, etc.) may be included but it must be indicated in the reference list from where it may be obtained.

Unpublished material (R.K. Smith, unpub. rep., 1976) or personal communications (T.L. Brown, pers. comm., 1977) should be identified as such in the text or as a footnote but are not to be included in the reference list.

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[1] The word 'formation' as used here and in the Table of Formations is employed in a general sense to include rocks of all types, whether sedimentary, volcanic, intrusive, or metamorphic, which together or separately constitute a map unit. As such it must be distinguished from the word 'formation' as more properly employed to designate a lithological map unit of sedimentary or volcanic origin.

Examples of Tables of Formations

System	Series	Formations and thickness (m)	Lithology
Mesozoic	Upper Jurassic or Lower Cretaceous	Coast intrusions	Granodiorite, quartz diorite; minor syenite and granite
		Intrusive contact	
		Eldorado Group 500	Mainly sandstone and shale; some conglomerate (fossiliferous)
	Unconformity		
	Upper Triassic	Tyaughton Group 2500±	Fossiliferous dark grey limestone; quartzitic and argillaceous beds; intercalated volcanic rocks
Unconformity			
Paleozoic	Permian(?)	Fergusson Group 1000+	Crystalline limestone, chert, slate; sheared andesitic lavas (greenstones)

Radiocarbon years B.P.	Geologic-Climate Unit	Lithologic Unit		Radiocarbon Dates
	Recent	Postglacial Sediments	-St. Helens Y tephra-	GSC-298[1]; 3 390 ± 130 GSC-345[1]; 3 410 ± 130
			-Mazama O tephra-	GSC-214[2]; 6 270 ± 140 GSC-206[2]; 7 610 ± 150 GSC-193[2]; 8 900 ± 160 GSC-526[3]; 9 750 ± 170
10 000	Fraser Glaciation	Kamloops Drift	Upper stratified unit	GSC-1524[4]; 10 500 ± 170
			Unstratified unit	
			Lower stratified unit	
20 000	Olympia Interglaciation	Bessette Sediments		GSC-194[2]; 20 230 ± 270 GSC-477[3]; 21 630 ± 870
30 000				
40 000				
	-(beginning before 43 800 B.P.)			
	Okanagan Centre Glaciation	Okanagan Centre Drift	Upper stratified unit	GSC-479[3]; >22 200
			Unstratified unit	GSC-275[1]; >32 700
>40 000			Lower stratified unit	GSC-413[1]; >35 500 GSC-258[2]; >37 200

[1]Dyck, et al., 1966
[2]Dyck, et al., 1965
[3]Lowdon, et al., 1967
[4]Lowdon and Blake, 1973

If no author is given for a publication, the agency responsible for the work should be substituted.

There are three basic types of references cited in Geological Survey reports. For each type, the following information is required to identify the work properly in the reference list:

1. *An article in a journal or series:*
   - names and initials of all authors
   - year of publication
   - title of the article as it appears in the journal, only
   - proper names are capitalized
   - name of the journal and/or series periodical
   - volume number
   - relevant page numbers

Example: Eisbacker, G.H.
1977: Mesozoic Tertiary basin models for the Canadian Cordillera and their geological constraints; Canadian Journal of Earth Sciences, v. 14, no. 10, p. 2414-2421.

2. *A book:*
   - the names and initials of authors or editors
   - year of publication
   - title of book as it appears on the title page
   - edition number, if given
   - name of publishing company
   - city and country of publication
   - total number of pages in the book

When citing a book in the text, the author, year of publication, and the relevant page number referred to should be given.

Example: Holub, V.M. and Wagner, R.H., ed.
1978: Symposium on Carboniferous Stratigraphy; Geological Survey, Prague, 472 p.

3. *An article in a book or symposium volume:*
   - the names and initials of authors, year of publication, title
   - title of the article
   - the name of the publication in which it occurs
   - name of the editor, if any
   - name of the periodical, journal, or publishing company
   - volume number or name of publishing company and place of publication
   - the first and last pages of the article

Example: Harris, I. McK.
1974: Iceberg marks on the Labrador Shelf; in Offshore Geology of Eastern Canada, Volume 1, ed. B.R. Pelletier; Geological Survey of Canada, Paper 74-30, v. 1, p. 97-101.

As of January 1, 1979 names of journals, periodicals, etc. are no longer abbreviated in publications of the Geological Survey of Canada. Such citations should be written out in full in the list of references submitted with each manuscript. Terms such as volume, number etc. are abbreviated. The words Memoir, Bulletin, Economic Geology Report, Paper, etc. are not abbreviated.

volume	v.	number	no.
page(s)	p.	series	ser.
		part	pt.

Tables

Tables should be typed (double-spaced) each on a separate sheet. Titles should be short. They are given arabic numbers. Do not make a simple list into a table by giving it a number as the number will have to be removed and all other tables and references thereto renumbered thereby giving rise to possible error.

Appendix

An Appendix is the place for detailed information that does not readily form part of the main report. Lengthy stratigraphic sections, locality lists, analyses, numerical data are examples of typical appendix material. To lower printing costs, to reduce the size of a report and to eliminate the chances of error inherent in retyping such material increasing use is being made of microfiche in handling appendix-type information.

Index

Indexes are commonly included with Memoirs, Bulletins and Economic Geology Reports that contain more than 100 pages. If an index is required you will be asked to prepare it at the same time as you check the page proofs.

Personal names, geographic names, names of mining companies, names of rocks and minerals, geological processes and geological units and provinces are those commonly included. An index is most easily prepared using individual cards for each entry for recording the appropriate page numbers.

Illustrations

Illustrations comprise maps, figures (photographs, line drawings), and where appropriate, plates. Give careful consideration to the size of the finished product as very large illustrations cannot be reproduced in the book and must be inserted in a pocket. This causes delays and extra printing costs. Tip-ins are not acceptable.

Maps

The Geological Survey publishes both coloured and uncoloured maps. The first are used to illustrate terminal reports or form part of compilation series such as the 1:1 million scale atlas. Uncoloured maps may be used to convey preliminary results or to portray relatively simple situations. Certain projects, for example the terrain inventory studies in various parts of northern Canada, result in the compilation by the scientific staff of scores of maps. By establishing appropriate standards it has proven possible to use the compiler's original linework thereby reducing the publication time and the work load of the cartographic section. Project leaders are urged to discuss publication plans with the Superintendent of Cartography to eliminate the chance of duplicate drafting.

Authors are responsible for ensuring that all geographical names used in the text are shown on the manuscript map. Names proposed for unnamed features should be submitted to the Superintendent of Cartography who will forward the proposal to the Canadian Permanent Committee on Geographic Names. Proposals should be in the form of a memorandum. The origin of the name should be given, and the feature should be indicated on a copy of the appropriate NTS map which should accompany the submission.

Technical details concerning the compilation by the geologist of the manuscript map have been given in an earlier section of this publication. Time and effort will be saved if these guidelines are followed. If there are any uncertainties do not hesitate to consult with the supervisory staff of the Cartographic Section.

Photographic Illustrations. With the exception of grouped photographs of fossils or grouped photomicrographs, which are called "Plates" in Geological Survey publications, all photographs are referred to as "Figures". Photographs should be forwarded *unmounted*. If linework or lettering is required it should be on the photograph when submitted. The use of overlays is not encouraged because of the problems they cause at the printers. Plates should be mounted on stiff cardboard. All lettering and identification should be on the plate when submitted. Plate size for size-as reproduction is 18 by 23 cm (including plate number).

Photographs intended for publication should be submitted with complete caption, GSC photo number, and if the photograph is not by the author, by an acknowledgment to the person or organization responsible. It is the responsibility of the author to ensure that written permission is obtained where necessary.

The following points should be borne in mind when selecting photographic illustrations.

1. Originals should be technically good photographs. Little can be done with an underexposed landscape shot. Remember that some clarity likely will be lost during printing.
2. Panoramic shots, however useful in the office, suffer when reduced to page size. They are too long for their width and end up as narrow strips in which most detail has been lost.
3. No uncatalogued photographs will be reproduced. The author must submit those photos he wishes to have published together with a short caption to the Photographic Section for cataloguing. If you think an illustration is worth publishing then the chances are someone else will want to use it. Without a number it is difficult for the Photographic Section to meet outside requests. Duplicate negatives will be made if necessary.
4. Do not over-illustrate. Only photographs that contribute materially to the subject of the report should be selected. Reference must be made to all photographs at least once in the text.
5. Prints must be in good condition without cracks or metal clip marks as these are flaws that cannot be eradicated.
6. Do not write unnecessarily on the back of a photo. A hard pencil will create an embossed effect. Use a soft pencil or stabilo pencil to note the figure number. If there is any ambiguity indicate which is "top".

7. Use a bar scale on photomicrographs rather than stating magnifications. This obviates the chance of a misleading caption should the scale of the photo be changed during the preparation of the printing plates.

Line Drawings. Although line drawings can be a valuable adjunct to a report, excessive drafting demands may delay publication and if a text is adequate or can be made adequate by rewriting, then duplication of the text by drawing should be avoided.

For the Current Research reports in the Paper series, all line drawings must be submitted in a form suitable for direct reproduction from the author's copy. The text and illustrations are sent to the printer as "camera ready" and are then reduced photographically 4:3 to the final size for the publication, 22 by 28 cm. Figures, maps or line drawings should be submitted suitable for this degree of reduction. This greatly simplifies the assembly and layout process and greatly reduces the printing cost; i.e. full-page figure, with caption inside figure, should not exceed 23 by 29.5 cm; single column figures 11.5 by 29.5 cm. For other Paper series reports authors are encouraged to submit neat figures that can be used without further drafting. They should be in ink and planned for spacing and size so that typewritten letters can be inserted for not more than 2:1 reduction.

Perhaps the principal feature to bear in mind in preparing copy for figures, aside from the question of their necessity in a report, is that only the essential information should be shown. Omit all details not referred to in the text or that do not bear directly on the written account. If, for example, the author is describing the system of faults encountered at the surface and in several underground workings of a mining property, the drawing should not be cluttered with details of mine buildings, roads and trails, orebodies, or mine workings unrelated to the fault pattern. If the vein system on this property also requires illustration, let this be done on a separate figure.

The directive arrow on a figure should be marked either true (astronomic) or magnetic north, preferably the former. In general a linear scale, or a natural scale, should be avoided and a bar scale used instead as it applies equally well whether the figure is enlarged or reduced from the original drawing.

Separate lists of full captions and short captions should always be furnished; a copy of this list may be cut apart for attachment to the illustrations. The briefer titles are used in the list of illustrations provided for the table of contents at the beginning of the report. Inasmuch as most figures are distributed through a report, the desired position for each illustration should be clearly indicated in the manuscript text. Do not waste time lettering the title within the figure; all titles form part of the text and will be typed or typeset as part of the production process.

If illustrations are reproduced without change from another publication, acknowledgment must be clearly made. The onus is on the author to obtain copyright clearance if this is necessary. The following should be noted:

after: possible redrafting but no change in information
modified: some change
adapted: radical changes

Paleontology

Lists of fossils identified by members of the paleontological staff and outside consultants are sometimes included in Survey reports. Accuracy of these lists and any opinions on age and correlation arising out of such fossil determinations are the responsibility of the paleontologist who identified the fossils and who must be named in the text. His reports should be cited correctly and suitably acknowledged and he must be given an opportunity to check the appropriate parts of the manuscript before it is submitted to the geological editor, especially if some time has elapsed since the identifications were made.

Varying degrees of accuracy and probability of identification can be expressed in a fossil list. In order to provide some degree of uniformity the following usages should be followed where possible:

Leptaena cf. *L. rhomboidalis* (Wilckens) — Similar to *L. rhomoboidalis* and possibly conspecific with it.
Leptaena aff. *L. rhomboidalis* (Wilckens) — Closely related to *L. rhomboidalis* but possibly a different species.
Leptaena? concava Hall — Genus in doubt, but identification at the species level considered certain.
Leptaena rhomboidalis? or *L. rhomboidalis* (Wilckens)? — Species in doubt, but generic determination believed to be correct.
?*Leptaena rhomboidalis* (Wilckens) or appropriate combination of preceding; such as ?*Leptaena* cf. *L. rhomboidalis* — Whole identification doubtful.
"Leptaena" concava, Leptaena "rhomboidalis", "Leptaena analoga" — Quoted names used in a very broad or probably incorrect sense.

Designations such as "new species" (n. sp.) are used in English. Others such as *lapsus calami* are used in the traditional Latin.

There is no need for a comma between the author's name and the year when they are attached to a specific of genetic name: Genus *Meniscoessus* Cope 1882. But a comma should be inserted when they are used simply as a reference: ..... as we see in *M. major* (Russell, 1937).....".

Formal generic and specific names are italicized and should be underlined in typescript. Suprageneric and anglicized names are not italicized: "The genus *Spirifer* is in the family Spiriferidae which includes the true spirifers". Generic names may be species names and where such abbreviation follows a previous writing of the name in full under conditions that leave no ambiguity. Similarly, the name of the author should be stated at least once for all names cited in the text.

Systematic descriptions of new species must conform to accepted international standards and must include description, discussion, designation of a single name-bearing specimen, indication of any other material studied to establish a basis for the author's description of the species, stratigraphic and geographic distribution, and adequate illustration. Specimens should be referred to locality and specimen catalogues of the Geological Survey as: GSC loc. 12345 and GSC 54321.

Aside from the formal requirements of systematic paleontology it is essential that full documentation be given for all fossil collections that are referred to in a geological report. Stratigraphic position as height above a known datum or recognizable contact should be given where possible, together with adequate descriptive geographic locality information, and GSC locality number when assigned. Similarly fossil material taken from boreholes should quote depths and accepted name and locality description for the hole.

A synonymy is appropriate and necessary for many systematic descriptions. A good synonymy, together with any new material described, is the basis of the immediate author's concept of the species. It should only contain citations personally verified by the author from original publications or specimens that are included within his interpretation of the species. Two forms of synonymy discussed by Schenk and McMasters[1], are recommended for use in Geological Survey publications.

Authors, critical readers and editors must all bear responsibility in ensuring that faunal and floral information is cited correctly and properly documented. Without such documentation it has little value, could be misleading and may reflect adversely on the author.

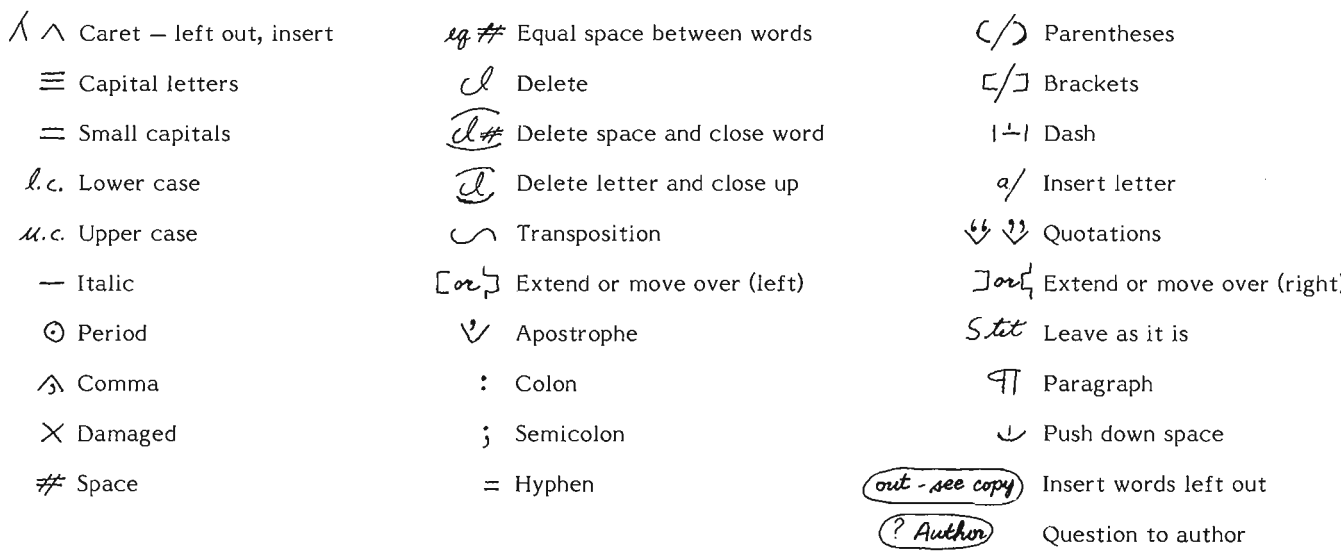
Correcting Proof

A copy of a report typed for photo-offset reproduction by the Word-Processing unit is sent to the Departmental proofreading unit for checking against the original manuscript. Corrections are made where necessary. It is common practice to send a photocopy of the proofread text to the author in lieu of the galley and page proofs that accompany typeset reports. The author may request minor changes at this stage.

Galley proofs of typeset reports are sent by printer to the Editorial Division, Department of Energy, Mines and Resources. They are checked against the author's manuscript and all typographical errors corrected. Corrected galley proofs are then sent to the author for final checking of subject matter. No textual changes may be made on the galley proof without reference to the Scientific Editor. Some minor changes may be made and it may be permissible to add a footnote in order to include reference to information not available when the report was submitted.

A second, later proof, the page proof, includes the Contents and line drawings and is sent to the author for preparation of the index. Changes should not be made in the page proofs. Any errors must be corrected without disturbing the spacing or number of letters in any given line.

Changes or alterations to printed proofs, other than printer's errors, are charged to the Geological Survey and may considerably affect the estimated publication cost of a report. They also tend to reflect on the competence of the author.



[1] Schenk, E.T. and McMasters, J.H.: p. 17-23 in Taxonomy; Stanford University Press, 1956.

AIDS TO WRITING

The essence of good scientific writing is clarity and conciseness. If the following rules were always observed the editors' lives would be very happy.

1. Condensation – get rid of participal phrases by splitting into two sentences.
2. Eliminate the impersonal formula.
3. Translate the roundabout passive into direct or active form.
4. Cut out circumlocutions for which a single particle suffices.
5. Reject "the" unless absolutely necessary.
6. Rewrite in simple sentences long and complex ones.

Previous editions of this book included a part devoted to most common errors in spelling, and use and misuse of words encountered in manuscript geological reports by the scientific editors of the Geological Survey.

Experience has shown that all too few authors have followed the suggestion made in earlier editions that they expand their knowledge of technical writing by consulting textbooks readily available in the Survey library. For this reason revised editions published since 1968 contained sections on technical writing reproduced from the "Canadian Government Style Manual for Writers and Editors" which was published in 1962. The "Style Manual" was prepared by an interdepartmental committee and the resulting book was approved by the Canadian Government Specifications Board, a body consisting of the Deputy Ministers of most federal government departments.

In the interests of consistency some alterations have been made, but in general the text is as originally published. Also included in the following section are parts on spelling and usage especially applicable to geological writing and adapted from earlier editions of this report.

Suggested reference books

O'Connor, M. and Woodford, F.P.
1975: Writing scientific papers in English; Associated Scientific Publishers, Amsterdam; Oxford, New York.

Cochran, W., Fenner, P., and Hill, M. (eds.)
1973: Geowriting, a guide to writing, editing, and printing in earth science; American Geological Institute, Washington, D.C.

Fowler, H.W.
1965: A dictionary of modern English usage; second edition; revised by Sir Ernest Gowers; Oxford University Press.

GRAMMAR

Correct grammar is essential in good writing. The reader's confidence will be quickly destroyed by grammatical errors and misspelled words. Language may move with the times but grammar is still the guide for combining words correctly to express thought. Writers should therefore always distinguish between the colloquial form and the simple grammatical sentence free from worn phrases and jargon.

These notes do not cover the comprehensive range of a complete book on grammar but are intended merely to draw attention to common pitfalls.

The Sentence. In composing a sentence, place the related parts as closely together as possible. The following examples show how poor construction can confuse the reader:

> A report of injustice to orphans in a weekly magazine was published today. (The words *in a weekly magazine,* ought to follow *report* or, alternatively, *published.*)
>
> The continued construction of low-standard buildings is predicted to have a detrimental effect on a certain development by well known architects. (The words *by well known architects* ought to have been placed after *predicted* to make the meaning clear.)

Nouns. There are two kinds of nouns – common and proper. Common nouns may be concrete or abstract. The concrete noun refers to a tangible or physical object and is therefore the mainstay of the language; abstract nouns usually refer to a quality. Always prefer a concrete to an abstract noun. Avoid (a) nebulous abstract words such as *conditions, position* and *situation*; (b) using concrete words such as *matter* and *case* in an abstract sense; (c) using the word *thing* instead of a definite name for the subject.

The following sentence is an example of complete jargon:

> The position in regard to this whole thing is that active consideration cannot be given to it until present conditions change and the matter can be settled and the situation clarified in due course.

Contrived Words. A crop of contrived words has recently come into existence.

assessability
identicability
performability
substitutability
definitize
futurize
healthwise
financialwise
weatherwise (as an adverb)

These contrived words have little place in official writing, however common their use may be in conversation.

Collective Nouns. Collective nouns such as *cabinet, committee, board* and *commission* take their verb or pronoun in either the singular or plural, depending upon the meaning in the context. Use the plural when the action is taken by the individual members considered in their separate capacities. Use the singular when the group acts or thinks as a whole.

> The committee have discussed all aspects of the case and have not yet reached agreement.
> The committee approves unanimously and directs its subcommittee to take immediate action.

With the word *government* the singular form is usually preferred and is always correct. Remember, however, that whether singular or plural is used, the verb and pronoun must agree.

> The government takes a serious view of the strike, and will do its best to bring about a settlement.

Series – A series of pamphlets was issued.

Limestone not limestones (as a collective).

number – A large number of problems were encountered; *but* the number of solutions was limited.

Pronouns. Pronouns take the place of nouns. Use them freely rather than repeat the noun unnecessarily. Too often the word *such* is added to the repeated noun to stress the particular reference.

> The department has adopted an automatic computer system and has taken special precautions against its misuse. (*not* against misuse of such a system.)

Former and Latter

The words *the former* and *the latter* are used instead of a pair of names, nouns, or groups, to avoid repetition. These terms should be used sparingly. They often confuse and irritate the reader, who must look back to be sure of the reference. If three or more persons or objects are referred to, the words *first* or *last* should be used. *Latter* is frequently and unnecessarily used for another pronoun, as in the following sentence:

> During the maneuvers the Commanding Officer set the recruits aside because of the latter's inexperience (their inexperience).

Note that had there been only one recruit, the use of *latter's* instead of *his* would have been necessary to avoid the implication that the officer was inexperienced.

Pronouns Taking Singular Verbs

(a) *none* – singular when it means no one, no person, no thing but plural when it means no persons, no things, not any.

> None of us *was* hurt (not one of us.....)
> None *were* hurt (not any)

(b) Words such as *either, neither, each* and *everyone* used as pronouns.

> Neither of the clerks is eligible.
> Everyone complains that his pay is inadequate.

The words *any* and *none* replace *either* and *neither* when the reference is to more than two.

The Relative Pronouns *that* and *which*. *That* in a sentence restricts or defines the meaning of the word or phrase that goes before it.

The new logistics report that I prepared is now ready.

Which neither restricts nor defines but comments on or expands the meaning of the preceding phase, usually by adding a new thought.

The new logistics report, which is much longer than the first, is now being distributed.

Critics differ regarding the use of the relative pronouns *which* and *that* but *that* introduces the restrictive clause and *which* introduces the nonrestrictive clause.

A test of whether the clause is restrictive or nonrestrictive is to omit it. If its omission changes the meaning or results in a statement that does not make sense or is incomplete, it is restrictive. If it can be omitted without changing the meaning, it is nonrestrictive.

The restrictive clause should not be set off by commas, even if it is decided, for reasons of euphony, clearness, or emphasis, that a *which* is better than a *that* to introduce it. A nonrestrictive clause generally is set off by commas, but there are sentences in which, because of context or because of other punctuation, the nonrestrictive clause is not set off by commas.

The misuse of *that* and *which* sometimes changes the meaning of a sentence. In the one "I return the reports, *which* I have read" the borrower implies that he has read them all. If he says "I return the reports *that* I have read", it means that he is returning only those reports that he has read.

That is used after a superlative.

The best car that his company has ever produced.

In current usage *that* replaces *who* when the preceding phrase is general in its implication and does not refer specifically to a person or persons.

The staff that works in that office.
The official who works in that office.

A phrase such as *and which, and who,* or *and whose* requires a preceding relative pronoun to justify the *and*:

This district, *which is* the largest and which contains the principal mine, is in the western part of the country.

The statement applies also when the conjunction *but* is used.

Where a restrictive clause is followed by an *and which* clause, both clauses take *which*:

The district *which* is the largest, and which contains the principal mine....
not The district *that* is the largest, and which....

The Relative Pronouns *who* and *whom*. The purist is as likely to be criticized for insisting on *whom* in awkward cases as the careless writer who rarely uses it in the proper place. There are exceptions but none, however, to the following:

Who is always used as subject; *whom* as object.

They are punishing people who we know are innocent.
They are punishing people whom we know.

Whom is used after every preposition, because prepositions take the objective case.

to whom
from whom

Whom is used after than; never use *than who.*

Pronouns Used as Objects. Put pronouns in the objective case when they are the objects of verbs or prepositions.

The quarrel is between you and me.
He directed my colleague and me. (*not* my colleague and I)
He sent a directive to my colleague and me.

Possessive Pronouns. Use the possessive forms *my, his, our, their,* when the present participle form of a verb is used as a noun; that is, words ending in *-ing.*

Count on my doing all in my power. (*not* count on me)
This will not affect his going. (*not* him going)

Verbs. Verbs may be *transitive*, denoting action, or *intransitive*, describing a state of being. The verb *to be* is a typical intransitive verb because it reflects back on its subject. It is also one of the important auxiliary verbs. It combines with almost all verbs, both transitive and intransitive, in their present and past participle forms. It is in dealing with the verb *to be* that most difficulties arise. A study of this verb and the verb *to have*, which also acts as an auxiliary, is commended to all who are interested in good grammar.

Transitive verbs always take the objective case. Intransitive verbs, including the verb *to be*, do not take the objective case.

It is we *not* It is us
It is they *not* It is them

The verb always agrees in number with the subject.

The crowd was excited.

Avoid the temptation to use the plural in longer sentences.

The crowd of spectators leaving the grounds was excited.

A singular verb is necessary when the subject is singular and the complement plural.

Our only guide was the Regulations.
but The Regulations were our only guide.

The word *what* takes a singular verb even if its complement is plural.

What we need is more books.

Words joined to the subject by *with, together with, including, as well as* and similar connectives do not affect the number of the verb.

The foreman, as well as the men, was leaving

If the word *number* is used collectively, the verb is singular.

The number of clerks is larger this year than last.

If individual units are referred to, the word *number* takes the plural verb.

A number of the clerks are taking summer courses.

The Split Infinitive. Split infinitives are unpleasant to the ear and jolt the reader by interrupting the action implied by the verb.

to frankly speak
to sincerely thank you
to once again recall the incident

At times, however, it is permissible for emphasis to split an infinitive when it would be awkward to put the adverb before or after the infinitive.

Auxiliary Verbs *shall* and *will*. To express the simple future, use the auxiliary *shall* in the first person and *will* in the second and third persons. These auxiliaries are reversed to express determination or command, as *I will, you* or *they shall*. This has always been the rule but the modern trend is to neglect the *shall* and the conditional form *should* and to use instead *will* and *would* in the first person, as in "I would like to do it" rather than "I should like to do it". Colloquialism is so strong an influence in the use of these auxiliaries that it is doubtful that fixed rules would help the writer. In the book, *The King's English*, Fowler devotes twenty pages to *shall* and *will*.

The Subjunctive. The subjunctive is rapidly falling into disuse. Its few remaining regular uses include:

(a) certain common expressions
come what may if need be

(b) legal or quasi-legal language
I move that the meeting be held in Quebec.

(c) conditional sentences where the hypothesis is not a fact
If I were you, I would write to the Commission today
If he were here, I would tell him what I think of it

(d) the expressions *as if* and *as though*, if the hypothesis is not accepted as true
He spoke of his proposal as if it were a complete solution of the difficulty

(e) expressions of uncertainty, doubt or supposition
He wondered if he were right.

Active and Passive Voice. The consistent use of the active voice wherever possible makes for better and clearer writing. Make the initiator of the action, not the object acted upon, the subject of the sentence.

The Deputy Minister wrote a letter expressing disapproval.
not A letter was written by the Deputy Minister expressing disapproval.

Sometimes authors lose sight of the logical subject of a sentence. They begin a sentence with a clause containing an active verb and then ineptly introduce a new subject that leads to the use of a passive verb.

These vugs carry no gold and do not affect the tenor of the vein.
not These vugs carry no gold and the tenor of the vein *has not been affected by them.*

The workings were closed and could not be *examined.*
not The workings were closed and *examination of them* could not be *made.*

This series is made up largely of shale *but includes* much sandstone and limestone.
not This series is made up largely of shale *though* much sandstone and limestone *are included.*

"It" subjects should be avoided (e.g. "It will be seen that.....").

Gerunds. A gerund is a verbal noun. When used as a subject or object, it must take the possessive (see Possessive Pronouns).

Women's having the vote reduces men's political power.
Delegation of its authority would be contingent upon the Commission's establishing procedures to be followed.

This rule is most often ignored when words are inserted between the preposition and the gerund.

This man has been refused employment because of his membership's in a trade union being terminated.

Writers with any sense of style do not allow themselves to fall into this trap. It can be avoided by rewriting.

Adverbs. Place adverbs so that there is no doubt which word or words they modify. They are usually placed immediately before or after verbs, and before adjectives and other adverbs that they modify. Take special care with the adverbs *only, merely, just, almost, ever, hardly, scarcely* and *nearly.* Depending on the meaning write:

Only the members of the committee may receive carbon copies.
or The members of the committee may receive only carbon copies.

Resist the temptation to use *very* too frequently. Use *quite* only in its proper sense (*completely*).

Related words and phrases should be kept together. Some writers misplace adverbs and adverbial phrases, especially the adverbs *only, principally, mainly, chiefly, alone, also,* and *too.* Note the following sentences:

Their presence can be determined *only* by tests.
not Their presence can *only* be determined by tests.

The sediments were derived *principally* from quartzite.
not The sediments were *principally* derived from quartzite.

Adjectives. A sentence without adjectives and qualifying adverbs is stronger than one overflowing with them.

His speech was boring.
not His speech was exceedingly long winded and very boring.

The Board worked efficiently.
not The Board did its utmost, and worked extremely well and very efficiently.

Do not combine an abstract noun with an adjective when an adjective alone would do.

The letter was confidential.
not The letter was of a confidential nature.

The building was ornamental.
not The building was of an ornamental character.

Conjunctions. When *that* is used as a conjunction, do not use it again after an interjected clause, however long the sentence may be.

The Director knew that, however great the travel difficulties to be overcome, (that) his assistant would be there. (Omit the second *that*).

Use *while* only in its true sense of time.

You sign the letters while I get the stamps.

Use *and* instead of *while* in the following sentence:

At the conference the Deputy Minister gave a talk on estimates and (*not* while) the Assistant Deputy Minister spoke on administration.

Use *although* instead of *while* in the following:

Although (*not* while) the estimates do not provide for such an expenditure, the commitment must be met.

Do not use *also* as a conjunction after *and*.

The word *like* can be used as a conjunction in constructions such as "He ran like a deer" but it ought not to be used in the sense of *as* or *as if*.

They played the game as if they were determined to win.
not They played the game like they were determined to win.

The Articles *a* and *an*. The article *a* is used when the word following begins with a consonant sound. This includes the aspirated *h*, and the initial *y* and *w* sounds heard in *union* and *one*.

a minister — a hope
a uniform

The article *an* is used when the following word begins with a vowel or when a consonant initial has a vowel sound.

an object — an elevator
an M.D. — an NCO

Prepositions. Preposition means pre-position and in grammar this part of speech is intended to be placed before its object. However, a preposition can end a sentence as follows:

(a) When the spontaneity of the sentence would be lost by inverting the preposition.

He is the greatest statesman you have ever heard of.
not He is the greatest statesman of whom you have ever heard.

Officials worth talking to.
not Officials to whom it is worthwhile to talk.

That depends on what you write with.
not That depends on with what you write.

They read every book they could lay their hands on.
not They read every book on which they could lay their hands.

(b) When the preposition is part of a contrived verb. There are combinations of words that appear to end with a preposition but in reality they are verbal forms. The verb *put*, for instance, can have many meanings when what seems to be a preposition is attached to it, as *put about, put away, put back, put by, put down, put forward, put in, put off, put over, put through, put up* and *put up with.*

Do not confuse these verb forms with the superfluous preposition added to such expressions as *meet up with, visit with* and *study up on*, when the meaning is the same without the preposition.

Distinguish between "between" and "among". The first refers to two persons or things the second to more than two. "Divide money between A and B" *but* "Divide the money among A, B, and C". The exception to this rule is where the more than two items are considered severally divided. "Plant lettuce between the rows of beans".

Compound Prepositions. Use the conjunction *because* rather than the compound preposition *inasmuch as*. Another compound, *as to*, can be left out of most sentences without changing the meaning. Avoid such hybrids as *herewith, thereof, thereto, thereon* or *thereunder*.

Omission of Preposition. Do not omit the preposition.

(a) when a different preposition is required in a series
He had a knowledge *of* and a keen interest *in* geology.

(b) in expressions of time
He was appointed *on* October 1, 1958.

List of Prepositions. See page 65.

ABBREVIATIONS

It is best to avoid abbreviations in literary text although a few, such as *i.e., e.g., viz., A.D., B.C., B.P., a.m., p.m.*, are permissible. Abbreviations are commonly used in technical and legal publications, and are generally used in parenthetical and bracketed expressions, footnotes, tabular matter and bibliographies. The style of the text is followed in legends, tables of contents and indexes. Abbreviate words only when the shortened forms are generally recognized, and then take care to follow good usage.

A general list of abbreviations is given at the end of this chapter. It is not intended to be complete. There are a number of publications on accepted standard abbreviations in use in certain fields, particularly in various branches of science. Approved SI abbreviations are given on p. 13-14.

In recent years there has been a marked trend toward the deletion of periods from abbreviations for scientific and engineering terms, particularly in tabular matter and engineering drawings.

An abbreviation is capitalized or hyphened only if the unabbreviated word would be capitalized or hyphened.

Ontario Ont.	foot-pound ft·lb

The names of provinces, territories and districts may be abbreviated when they follow the name of a city, town, village or geographic feature. Otherwise the names should be spelled out.

Toronto, Ont.	Mount Robson, B.C.

The following abbreviations are used officially for the names of provinces and territories of Canada, and states of the United States. The names of seven states are not abbreviated.

Alberta ..... Alta.	Maryland ..... Md.
British Columbia ..... B.C.	Massachusetts ..... Mass.
Manitoba ..... Man.	Michigan ..... Mich.
New Brunswick ..... N.B.	Minnesota ..... Minn.
Newfoundland ..... Nfld.	Mississippi ..... Miss.
Northwest Territories ..... N.W.T.	Missouri ..... Mo.
Nova Scotia ..... N.S.	Montana ..... Mont.
Ontario ..... Ont.	Nebraska ..... Nebr.
Prince Edward Island ..... P.E.I.	Nevada ..... Nev.
Quebec ..... Que.	New Hampshire ..... N.H.
Saskatchewan ..... Sask.	New Jersey ..... N.J.
Yukon Territory ..... Y.T.	New Mexico ..... N.Mex.
	New York ..... N.Y.
Alabama ..... Ala.	North Carolina ..... N.C.
Alaska ..... —	North Dakota ..... N.Dak.
Arizona ..... Ariz.	Ohio ..... —
Arkansas ..... Ark.	Oklahoma ..... Okla.
California ..... Calif.	Oregon ..... Oreg.
Colorado ..... Colo.	Pennsylvania ..... Pa.
Connecticut ..... Conn.	Puerto Rico ..... P.R.
Delaware ..... Del.	Rhode Island ..... R.I.
District of Columbia ..... DC	South Carolina ..... S.C.
Florida ..... Fla.	South Dakota ..... S.Dak.
Georgia ..... Ga.	Tennessee ..... Tenn.
Hawaii ..... —	Texas ..... Tex.
Idaho ..... —	Utah ..... —
Illinois ..... Ill.	Vermont ..... Vt.
Indiana ..... Ind.	Virginia ..... Va.
Iowa ..... —	Washington ..... Wash.
Kansas ..... Kans.	West Virginia ..... W.Va.
Kentucky ..... Ky.	Wisconsin ..... Wis.
Louisiana ..... La.	Wyoming ..... Wyo.
Maine ..... —	

The words *County, Fort, Mount, Point* and *Port* used as part of proper names should not be abbreviated.

Port Radium	Fort McMurray

The names of countries (except U.S.S.R. and U.S.A.) are not abbreviated in literary text.

Always spell out the names of the months in textual matter and in text footnotes, except when used in citations or references. They may be abbreviated in tabular matter and sidenotes. *May, June* and *July*, however, should not be abbreviated.

The names of the days of the week are not abbreviated, except in tabular work.

The ordinal forms *d, nd, rd, st, th* are not used after date and place numbers in literary text. When otherwise used, these forms do not require the period as they are not true abbreviations. Similarly, Roman numerals pronounced as ordinals after names do not require a period.

George V

Use the following abbreviations for titles preceding personal names:

Dr.	Mme* (Madame)
Hon.	Mmes* (Mesdames)
Mr.	Mlle* (Mademoiselle)
Mrs.	Mlles* (Mesdemoiselles)
Ms.	Md.
Messrs.	Msgr. (Monsignor)
M. (Monsieur)	Rev.
MM. (Messieurs)	St. (Saint)

Civil and military titles are abbreviated when they precede a given name or initials, unless the title is short, such as *Major*. In formal usage, such as invitations and announcements, the title is spelled out.

The titles *Honorable, Reverend* and *Monsignor* are abbreviated unless preceded by *the*. The first two titles are never used with the surname only.

Hon. Joseph Brown	the Honorable Joseph Brown
Rev. John Smith	the Reverend Mr. Smith (*but not* Reverend Smith)

The abbreviations *Esq., Jr., Sr.,* and abbreviations denoting academic degrees and honors, are used after a personal name preceded by a given name or initial. In arranging letters denoting distinctions of various kinds, those letters indicating distinctions conferred directly by the Crown should be placed first. These include V.C. (which invariably has precedence), P.C., the various orders of knighthood and their companionages in their proper order (for precedence of these orders see *Burke's Peerage* or *Whitaker's Almanack*), D.S.O., M.C., Q.C. After these should be placed letters denoting university degrees (degrees in Arts usually first), such as Ph.D., M.A., B.Sc., B.A., followed by letters denoting membership in societies and other distinctions, such as F.R.S.C., F.R.G.S., M.A.I. and A.I.A.

Hon. Charles M. Jones, P.C., D.S.O., Q.C., LL.D.
Philip Spratt, Q.C., M.A., Ph.D., F.R.S.
Henry O. Lundy, M.C., B.A., B.S.
James Smithers, E.D., M.S.

The abbreviation *Esq.*, and the complimentary titles *Mr., Mrs., Dr.*, are not used with any other title or with abbreviations denoting academic degrees and honors. A comma should precede abbreviations following a proper name.

Dr. John Jones; John Jones, M.D., *not* Mr. or Dr. John Jones, M.D.
Mr. Robert Smith; Robert Smith, Esq., *not* Mr. Robert Smith, Esq.
John Jones, Jr., *not* Jones, Jr., or Mr. Jones, Jr.

The legal titles of corporate names should be preserved. Such words as *Company, Corporation, Association, Limited* should not be abbreviated unless they appear in such form in the corporate name. Similarly, the ampersand (&) should not be used unless it is part of the corporate name. It is incorrect to use the ampersand in any other connection in literary text.

Compass directions are abbreviated as follows:

N	NE
S	SW
E	NNW
W	ESE

The abbreviations *NE, NW, SE, SW*, may be used to denote town and city divisions in literary text but the words *north, south, east, west* should always be spelled out.

In designating lands covered by Canada Lands Surveys, abbreviations of the following type may be used:

NE 1/4 sec., tp. 22, rge. 7, W. 3rd mer.

The words *street, avenue, place, road, square, boulevard, terrace, drive, court* and *building* are spelled out in literary text but may be abbreviated in footnotes, sidenotes and in tabular matter. If the word *Street* or *Avenue* forms part of a name, such as *Elgin Street subway*, it is not abbreviated even in parentheses, footnotes, sidenotes and tabular matter.

Periods and spaces are omitted from the abbreviated names of radio and television stations and from certain United Nations and government agencies and corporations, and other organizations:

CBC	CPR	NATO
CBOT	IUGS	RCAF
UNESCO	GSC	DND

* Note omission of period. The rule followed in the French language is to omit the period when the abbreviation contains the last letter of the word abbreviated. The academic title, "Dr." is not commonly used by French writers; M. is to be preferred.

Where there is a reference in the text to a large subdivision of a publication (Volume, Number, Part, Book, Section, Chapter), or to a smaller section that is part of a title (Figure, Table, Plate), the word is capitalized and not abbreviated. Such a word is always followed by a number.

Part 4 Table 10

Smaller subdivisions (paragraph, line, page) in the text are written in full, but are not capitalized except in main headings.

The exact location is page 247, line 13.
Notes to Pages 17-19

In a reference in some part of a work other than the text (e.g., footnotes, reference lists, tables) the words are often written without a capital and may be abbreviated as follows:

article	art.	page	p.
book	bk.	paragraph	par.
chapter	c. or chap.	plate	pl.
figure	fig.	part	pt.
line	l.	section	sec.
number	no.	volume	v.

The word *figure* in a legend or caption is not abbreviated.

Figure 2 — Surveyor at work.

Words borrowed from Latin should not be treated as abbreviations. No periods are required after the following:

via	et	finis	par	pro
ad	ex	in	per	sic

A General List of Abbreviations. The same abbreviation usually serves for both the singular and plural forms of a word.

a	year(s); Ma, million years
abstr.	abstract
A.D. (anno Domini)	in the year of Our Lord
a.m. (ante meridiem)	before noon
approx.	approximately
art.	article
assoc.	associate, association
asst.	assistant
av.	average
B.C.	before Christ
B.P.	before present
bldg.	building
C	Celsius
ca. (circa)	about
cf. (confer)	compare
chap.	chapter
col.	column
cont.	continued
dep.	department
doz.	dozen
Dr.	Doctor, Drive
e.g. (exempli gratia)	for example
et al. (et alii, -ae)	and others
etc. (et cetera)	and the rest, and so forth
et seq. (et sequens)	and the following
fig.	figure, figures
g	gram
h	hour
h.p.	horsepower
ib., ibid. (ibidem)	in the same place
id. (idem)	the same
i.e. (id est)	that is
Jr.	junior
km/h	kilometres per hour
lat.	latitude
loc. cit. (loco citato)	in the place cited
long.	longitude
max.	maximum
memo	memorandum
m/s	metres per second
min	minimum, minute
misc.	miscellaneous
MS., MSS.	manuscript, manuscripts
N.B. (nota bene)	note well
no.	number
op. cit. (opere citato)	in the work cited
p.	page, pages
par.	paragraph
pl.	plate, plates
p.m. (post meridiem)	after noon
proc.	proceedings
pro tem. (pro tempore)	temporarily, for the time being
P.S. (post scriptum)	postscript
ref.	reference
rpm	revolutions per minute
s	second
sec.	section
Sr.	senior
St.	Saint, Street
supp.	supplement
tp.	township
viz. (videlicet)	namely, to wit
v.	volume
vs. (versus)	against

CAPITALIZATION

In the English language certain words are intended to be written with capital letters for emphasis and to guide the reader in meaning and phrasing, in much the same way as punctuation. There are rules to define which words require capitals but modern usage has introduced a degree of flexibility not tolerated in earlier writing. Basic rules are given in this chapter. Allowance should be made in ambiguous cases for the intention of the writer and the interpretation of the reader.

First Word of a Sentence. Begin every sentence with a capital letter. In subdivisions of conclusions, recommendations or decisions, if the complete thought can be stated briefly, it is unnecessary to introduce the subdivisions with capitals.

The Defence Council decided to
(a) test guns
(b) order equipment immediately
(c) direct trials to be completed by October.

If the conclusion, recommendation or decision cannot be stated briefly, introduce each subdivision with a capital letter and end with a period.

Proper Nouns. Capitalize all proper nouns. Difficulty sometimes arises in making the distinction between common and proper nouns. Common nouns do not require capitals because they refer to everyday objects in a general sense. Proper nouns are so named because they belong and are proper to certain people, groups or objects set apart, or are words derived from these sources. Hence the names of months and days, derived from names of pagan gods and planets, are proper nouns whereas the seasons of the year, being common nouns, do not take capitals except when used poetically.

Proper nouns include:

(a) Names of persons and places (countries, counties, cities and other political and geographical divisions) and the names substituted for them.

John Doe	Canada
the Northern Hemisphere	Carleton County
the International Boundary	Montreal
the Continental Divide	Pickle Lake
the Prairie Provinces	Elm Street West
Prince Edward Island; the Island	

The examples *Pickle Lake* and *Elm Street West* are made up of common nouns transformed into proper nouns because they have become parts of place names.

Do not overuse substitute terms. Reports scattered with "the Bay", "the Island" reflect a parochial attitude.

(b) Names of the months and days, holidays, religions, languages, races, historical periods and events, and documents.

October	French
Wednesday	Negro
Thanksgiving Day	Fall of Rome
Roman Catholic	the War of 1812
Order in Council P.C. 1354	

(c) Names of organized bodies and the distinguishing names substituted for them.

the Parliament of Canada, Parliament
the House of Commons, the House
the Civil Service Commission, the Commission
the Department of Finance, the Department

The word *Department* is capitalized. This is the basic rule but few observe it. The trend is toward a less formal and more modest attitude in self-reference, especially in correspondence with the general public.

> Thank you for your letter, which has been passed to the appropriate branch of the department for immediate attention. In this department and the Department of Agriculture the hours are staggered to fit in with those of other departments of government.

(d) Names of institutions, churches, schools, libraries, buildings, hotels, clubs, corporations, ships, etc.

Toronto General Hospital	Confederation Building
St. Andrew's Church	Chateau Laurier
Ottawa Collegiate Institute	Bell Telephone Company
Vancouver Public Library	*CSS Hudson*

(e) Names and synonyms of the Deity, and synonyms of the Bible.

the Creator	Holy Writ
the Great Architect	

f) Titles of royalty and nobility, and of rank when used with a name.

Her Majesty — His Grace
Lieutenant Smith

(g) Official titles of persons when used without their personal names.

the Prime Minister — the Solicitor General
the Premier — the Minister
the Secretary of State — the Commissioner

(h) Titles of courtesy to be used when addressing a person.

Sir — Father
Madam — Uncle

Filial names are not capitalized when used with possessive pronouns.

my mother

Common nouns automatically become proper nouns and are capitalized:

(a) When they refer specifically to events, institutions or similar objects and are therefore no longer used in the general sense.

declaration independence *but* Declaration of Independence
war roses *but* Wars of the Roses

Capitals are not used in any general reference to departments, branches, committees and positions, but only when naming a particular one.

There are many technical and advisory committees in this department such as the Committee on Armament Development and the Advisory Committee on Pay and Allowances.

The positions of administrative officers in the Department of External Affairs range from Administrative Officer 1 to Administrative Officer 8.

Use capitals to designate a functioning body but not when referring to the component members of that body.

All the chiefs of staff were present at the last Chiefs of Staff Committee meeting.

(b) When they become an essential part of a proper name.

Elgin Street — Brighton Pier
Royal Ottawa Golf Club

(c) When common nouns such as *north* and *east* are used to name a specific region and its inhabitants.

the West — people of the South
the Westerner

Note that the points of the compass when abbreviated take capital letters but no period.

N — NW
E — SSW

Proper Adjectives. Capitals are used for proper adjectives because they are derived from proper names.

Franciscan friar — Douglas fir
Greek vase

A proper adjective is associated with the person or place from which the adjective is derived. When this association is remote, the adjective becomes common and no longer takes a capital.

pasteurized milk — chinaware
portland cement

Quotations. Use a capital letter for the opening word of a quotation but not of quoted phrases.

John said, "They have gone".
Their future held only "blood, toil, tears and sweat".

Titles of Books and Plays. Capitalize every important word in literary titles. Prepositions, articles and conjunctions do not take capitals unless one of them is the initial word in the title.

A Star Is Born — *An Early History of Canada*
As You Like It — *But Few Returned*

Salutation and Complimentary Closing. Use capitals in the first word and all nouns in the salutation of a letter but in the first word only in closing.

My dear Sir	Yours truly
Dear Madam	Very sincerely yours

Hyphened Compounds. A proper noun or adjective in a hyphened compound retains the capital.

anti-Communist	neo-Gothic
Greco-Roman	

Abbreviations. Abbreviations of decorations and degrees, and of countries, are capitalized and punctuated.

M.B.E.	U.K.	N.W.T.
D.F.C.	U.S.A.	Y.T.
LL.D.	U.S.S.R.	P.E.I.
Ph.D.		

Abbreviations for radio and television stations, certain United Nations and government agencies, and other organizations are capitalized but not punctuated.

CBOT	GSC	DND
UN	EMR	DVA
NATO	USGS	CGSB

Examples of Capitalization

Alaska Highway, Trans-Canada Highway, Mackenzie Highway, Toronto-Hamilton highway, Highway 417
Appendix A
arabic numerals (*not* Arabic numerals)
Arch, as in Boothia Arch
Arctic Islands
area, as Rouyn-Bell River area
Atlantic Provinces
Avenue, as in Carling Avenue

Basin, as in Michigan Basin

^{14}C
Cambrian System
Cambrian time
Canadian National Railways
Canadian Pacific railway (line), *but* Canadian Pacific Railway (company)
Cenomanian Stage
china clay
City of Ottawa
claims A61239 to A61244; Nancy claim
coast, as in Pacific coast, *but* the Coast (cf. the Prairies)
Coast Mountains, *but* eastern Coast Mountains
County, as Pictou County
Creek, as Lost Creek

Early Precambrian (=Archean), *but* early Precambrian (indefinite)
Eastern Canada
Eastern Townships

Fault, as in Gloucester Fault
Figure 6 (Fig. 6)
Foothills (as analogous to Rocky Mountains)
Foothills Belt
Formation, as Ottawa Formation
Forty-ninth Parallel (an International Boundary) or 49th Parallel; *but* fifty-first parallel or 51st parallel
Fraser River *but* Fraser River valley

Geosyncline, as in Franklinian Geosyncline
glacial Lake Iroquois
government control, *but* the Government
Great Divide
Great Plains, the Plains (as a physiographic province)
Group, as Windsor Group
grouse; willow grouse; Franklin grouse

india ink
International Boundary; the Boundary

Lake, as Great Slave Lake
Late Precambrian (=Proterozoic), *but* late Precambrian (indefinite)
Lowland, as St. Lawrence Lowland
lower Paleozoic, *but* Lower Ordovician

Maritime Provinces
Member
141st Meridian (an International Boundary), *but* 142nd meridian
Mile 105, Alaska Highway
Mine, as McWatters Mine
mining division, as Kamloops mining division
Mount Robson, *but* the mountain

Orogeny
Ottawa and Rideau rivers

Pacific coast
Paleozoic Era, *but* fossils of Paleozoic age
paris green
Peace River Block
Plateau, as Stikine Plateau
Pole, the Pole, North Pole
portland cement
post-, as post-Triassic
post office, as Red Lake post office
Prairie Provinces, the
pre-, as pre-Ordovician, *but* Precambrian
proto-Atlantic Ocean
Province of Quebec; the province
Provincial Government
Province, as in Churchill Province; also Subprovince

River, as Mackenzie River
ranges VII and VIII
Rocky Mountain Trench
roman numerals (*not* Roman numerals)

Section 8
Street, as Sparks Street

Table No. 1
Township, as Fitzroy Township

valley (as Midge Creek valley, *but* Midge Valley)
Village (as Village of Rockcliffe Park)

West, the

Yukon-British Columbia boundary; the boundary; an international border *but* the International Boundary.

Note: When geographic names are applied to established geological or structural features the descriptive term should be in capitals e.g. Gloucester Fault. Assumed features or small-scale features should be designated informally.

COMPOUNDING OF WORDS

> The hyphen should be used only when necessary to clarify understanding.
>
> One must regard the hyphen as a blemish to be avoided wherever possible.
>
> Winston Churchill.

Words frequently used in close association tend to become unified in form as they are in meaning, and ultimately to acquire a single accent. There are three stages in the development of compounds. At first the components of the compound expression are written separately; next they are united by a hyphen; finally, when the separate significance and accent of these components have been lost sight of, they are combined into one word. The hyphened stage may thus be considered merely preparatory to the coalescence of the various members into one word. Many such compounds have now fully coalesced and are written as one word, as *aircraft, lifetime, grindstone, byword.*

Words used in their ordinary grammatical relationship – for example, noun and attributive adjective – ought not to be hyphened. A typical example of this rule is afforded by adverbs ending in *ly* standing before the words they modify. The relationship in this case is clear, and the hyphen is omitted. When, however, it is desired to show that the syntactical relationship between two words is closer than if they stood side by side without it, use the hyphen.

Whenever the compound expression has a meaning different from that borne by its components in their ordinary grammatical relationship, the hyphen is used, as in the expression *red-coat* (referring to a British soldier). Other instances of the same relation are to be found in the expression *toy shop* as compared with *toy-shop*, and *zinc box* as compared with *zinc-box*. A *toy shop* is a child's mock shop; a *toy-shop* is a shop where toys are sold. A *zinc box* is a box made of zinc; a *zinc-box* is a box that is used to contain zinc.

Nouns

Hyphenate:

(a) nouns of equal value

man-child	city-state

(b) nouns written as two words, when they have a modifier

red colour-filter	*but* colour filter
public letter-writers	*but* letter writers

Do Not Hyphenate:

a compound noun that has become a single specialized word

aircraft	schoolboy
lawgiver	glassware

but if such a noun has a modifier that modifies only the first part, the compound is separated.

high-school boy	cut-glass ware

Hyphens should be used to clarify possible ambiguities, for example:

(a) compound adjectives when they precede the noun they modify

cold-storage vaults	short-term loans

(b) combination colour terms are separate words, but such terms are hyphenated when they are unit modifiers.

bluish green	bluish-green feathers
dark red	iron-grey sink
orange red	silver-grey body
blue green	blue-green leaves

(c) compound adjectives made up of a noun, adjective or adverb and a *present participle* if they precede the noun they modify

fur-bearing animals	far-reaching events
corn-raising area	north-trending fault

but if the compound is preceded by an adjective modifying the first word in the compound, omit the hyphen or, if it makes it clearer, use two hyphens

sweet corn raising area *or* sweet-corn-raising area

(d) compound adjectives made up of a noun or adverb and a *past participle* when they precede the noun they modify

soft-boiled egg	poverty-stricken family

(e) compound adjectives when the adverb of the combination could be misread as the modifier of the noun

more-open creek bottoms
shows much-improved growth

Do Not Hyphenate:

(a) a compound adjective when it follows the noun it modifies

The eggs were soft boiled

(b) adjectives used in the name of an institution or place

school board members	grand jury room

(c) compound adjectives made up of adjective and noun when both are capitalized

Safety First rules

(d) compound adjectives used in foreign expressions

laissez faire policy
a la carte luncheon

(e) if the adverb in a compound adjective could not be misread as an adjective modifying the noun (the use of hyphens with adverbs ending in *ly* is the most frequent violation of this rule)

equally productive means
too complacent attitude

(f) if the compound adjective is preceded by an adverb modifying the first word of the compound
a reasonably tall growing tree
but a tall-growing tree

(g) a two-word unit modifier, the first element of which is a comparative or superlative

better drained soil	larger sized grains
highest priced coal	best preserved specimen

Phrases

Hyphenate:

(a) many well known compounds

daughter-in-law	jack-o'-lantern
topsy-turvy	happy-go-lucky

(b) compound phrases used as attributive adjectives
the cost-of-living index
a long-drawn-out affair

but if there is little possibility of misreading, hyphens need not be used.
a story and a half house

Prefixes

Do not hyphenate after prefix except as follows:

(a) when the prefix is joined to a proper noun, unless usage demands otherwise

neo-Gothic	Subarctic
non-Christian	trans-Siberian
pro-British	un-American
but transatlantic	

(b) when *self* forms the first element of the compound

self-assured	self-possessed
self-control	

except selfhood, selfsame

Write as one word, except where clarity demands otherwise, compounds with *anti, bi, co, inter, intra, multi, non, post, pre, re, semi, sub, trans, tri*

anticlimax	preglacial
bimonthly	postdate
coexist	rebuild
interdepartmental	semiannual
intradepartmental	subcommittee
multicoloured	transcontinental
nonactive	triservice

but two similar vowels are separated by a hyphen

co-operate	semi-invalid
co-ordinate	

Suffixes

Do not hyphenate established compounds composed of nouns ending in *like*
childlike, nutlike, businesslike, *but* drumlin-like

except when the root word ends in two *l's*.
bell-like

Do not combine adjectives with *like* as in globularlike. Write either *globule-like* or *globular*.

Numerals

Hyphenate:

(a) compound numbers from twenty-one to ninety-nine
Twenty-two trees were cut down.

(b) an adjectival compound in which one component is a cardinal numeral and the other a noun or adjective

five-pound roast	one-sided affair

Note two-rod rows (compound adjective and noun)
two rod-rows (adjective and compound noun)

(c) ordinal numerals when they precede the word they modify
fifth-story room — third-rate play
first-class coach

(d) compounds of a numeral with *odd*
sixty-odd — 140-odd

but write as one word compounds with *fold* and *score*
fourscore — sixtyfold

Fractions

Hyphenate fractions used as modifiers unless the numerator or denominator contains a hyphen
a one-third share
twenty-fiftieths calcium
but twenty-nine fiftieths calcium

Do Not Hyphenate fractions used as nouns
Four fifths of the load was wheat and one fifth barley

Suspended Compounds

Hyphenate when a component common to successive compound adjectives is omitted.
first- and second-class fares — fine grained granite *but* medium- to
2-, 4-, and 6-inch measures — fine-grained granite

Titles and Offices

Hyphenate:

(a) when a compound is a double title
secretary-treasurer — treasurer-manager

(b) when the adjectives *elect* and *designate* form the last element.
president-elect — minister-designate

Do Not Hyphenate when the compound denotes a single office.
editor in chief — Governor in Council
Director General

There are many exceptions to this rule in common practice, such as vice-president, vice-chairman, and many military titles.

Compass Points

Hyphenate after the first point when there are three points.
south-southwest

Do Not Hyphenate direction of two points
southwest

Single Letters, Figures and Signs

Hyphenate a letter, figure or sign and the word it modifies.
U-boat — X-ray — $-mark

Do Not Hyphenate a unit modifier when the second element is a letter or figure
Class II railroad
Grade A milk

ITALICS

Italic type should be used sparingly. Its principal use is in paleontological reports. All genera, species and varieties should be italicized. Thus: *Posidonomya nahwisi* var. *goodrichensis*, devil's club *Fatsia horrida*, black bear *Ursus americanus*.

Italic type is also used to distinguish words that are not fully part of the English language especially Latin words and phrases.

Certain Latin terms and abbreviations such as *ibid., idem, infra, vide* are traditionally italicized. Do not italicize circa (ca.), cf., etc., e.g., et al., i.e., viz., vs.

Names of books, plays, newspapers, and ships may be either italicized or placed within double quotation marks.

As mentioned elsewhere in this publication the Geological Survey is making increasing use of word processing equipment in the preparation of printer's copy. A different element must be used to type each word for which italic type is required. This is time-consuming and we are currently double-striking letters in lieu of using italic type. This is satisfactory for paleontological reports but tends to over emphasize other words commonly italicized.

In line with current trends towards simplicity and to avoid heavy use of italics in paleontological works, many traditionally italicized expressions (such as see, in, pers. comm., in press) are now left in roman type. Designations such as sensu stricto (s.s.) when placed after a species name are not italicized but are italicized when they appear independently in the text.

NUMERICAL EXPRESSIONS

Most rules for the use of numerical expressions are based on the general principle that readers find numerals easier to grasp, particularly in technical, scientific or statistical matter.

In general, write in full numbers from one to nine inclusive. Where the text is interspersed with comparatively few numerical expressions, however, they are usually written out. In special cases figures may be used throughout.

General Rules

The following general rules cover the most common instances where the writer has to choose between using a figure or writing the expression in full.

1. At the beginning of a sentence write out all numbers and all terms of measurement that would otherwise be abbreviated. When two related numbers occur at the beginning of a sentence, both are written out.
   Three hundred persons are expected.
   Nine or ten men will be needed.
   Number 6 is not to be used in the display (*not* no. 6).

   In question-and-answer material, however, numerals may be used at the beginning of a sentence to express years, sums of money of one dollar or more, decimals and cumbersome expressions.

2. To avoid confusion when one numerical expression directly follows another, the forms illustrated by the following examples may be used:
   300 six-inch guns
   120 eight-inch boards
   twelve 10-cent pieces

3. Do not mix in the same phrase figures and numerals written in full.
   nine out of twelve *not* nine out of 12

4. In expressing approximate numbers, words are preferred to figures.
   About a thousand men sailed for home.
   The attendance was estimated at five hundred.
   Classes are limited to approximately twenty-five children.

   In expressing large numbers, write out the word *million* and similar terms.
   20 million
   $285 million

   When numbers larger than one thousand are written out, use these forms:
   two thousand and twenty
   one hundred and fifty-two thousand three hundred and five

5. Figures are used for serial numbers.
   Publication 680
   pages 99-146
   serial number 1197M-2
   number 7978

6. Numbers of dynasties, sessions of Parliament or Congress, political divisions, and numbered thoroughfares up to and including tenth, are generally written out.
   Fifth Dynasty
   Twenty-second Parliament
   Second Ward
   Fifth Avenue

7. Write out indefinite expressions.
   the early seventies
   the mid-thirties

8. When a number is written out, it should not be repeated in figures except in legal documents.

9. In mathematical and statistical reports, quantities and measurements are expressed in figures. For all other text matter, apply the general rule of spelling out numbers up to and including nine.

Specific Uses

Age

The number indicating a person's age is usually expressed in figures, except in literary text.

She was 9 years old on May 10.
She was 67 years, 8 months and 10 days old when she died.

Calendar or Fiscal Years

In referring to a period of two years or more, the en dash (not a hyphen) may be used.

1936-38 1946-47 1895-1913

If the word *from* precedes the year, or the word *inclusive* follows it, the second year is not shortened and the word *to* is used.

from 1933 to 1936
1935 to 1937 inclusive

The abbreviation *A.D.* should precede the year, and the abbreviation *B.C.* follow the year.

A.D. 937; 245 B.C., although 937 A.D. is commonly used

Date

August 1914
8 January 1942
April 25, 1955
The abbreviation for 25 June 1961 is 1961-6-25.

Decimals

2.75 cm
Pi is equal to 3.1416.
It costs $0.6421 a gram.

In text, use a cipher where there is no unit. In numerical statements, ciphers may be used to indicate the number of decimal places to which the value is significant: 0.60 implies significance to two decimal places, 0.6000 to four. Ciphers may be used in tabular statements to give an equal number of digits to the right of the decimal point, provided conflict with the above usage is avoided.

Degrees

latitude 49°21'18", longitude 72° 13'14" *or* 49° 21'18"N, 72° 13'14"W
35°30' (land distance, etc.)
minus 20°C
an angle of 45 degrees

to express a tolerance the form should be
30 ± 2°C

Distances, Dimensions and Other Quantities

for a distance of 5 feet 6 inches
30 km from Toronto
a 3-mile course
20/20 vision
2500 horsepower
8 by 12 cm
2 x 4 inch boards

In text, the form *8 by 12 cm* is preferable, but if there is a large number of such expressions, the form *8 x 12 cm* may be used.

Fractions

Fractions standing alone are generally written out. A fraction in figures should not be followed by *of a* or *of an*.

one-half inch
one half of a farm (see chapter on Compounding)
five one-hundredths
The insect was 3/4 inch long (*not* 3/4 inches) *but* 0.75 cm long.

Fractions used as modifiers are hyphenated: "a three-fourths share", "a two-thirds majority" but fractions in which the first element modifies the second are not: "two (adj.) thirds (noun) of the members".

Time

Use numerals to express clock time.

1000 h, 2145 h

Duration of time or time of day when given in ordinary reading matter should be written out.

They called at four o'clock.
The program starts at half-past two each afternoon.

Weights and Measures

Use figures in all enumerations of weights and measures.

PUNCTUATION

"Punctuation", says Eric Partridge, one of the modern authorities on the subject, "is not something you add to writing, even the humblest: it forms an inescapable part of writing." Its function is to help the reader understand what you have written by making clear the relationship between the various parts of the sentence. Improper punctuation can and often does alter the meaning and confuse the reader. The writer ought not, however, to rely upon punctuation to improve a poorly constructed sentence; he should rewrite the sentence.

There are ten recognized punctuation marks: period, colon, semicolon, comma, dash, question mark, exclamation mark, quotation marks, parentheses and apostrophe. Using them correctly is largely a matter of learning a few simple rules and then applying them with common sense. The modern trend is toward inserting only as much punctuation as the sense requires, not sprinkling the copy with commas and dashes in a haphazard way.

The following sections are intended to serve as a guide to logical punctuation.

The Period

The period, or full stop, is the first and most important punctuation mark.

The Period is Used:

(a) At the end of a sentence that is neither a question nor an exclamation.
When the play was finished, we went home.
Pull up your chair.

(b) After an abbreviation.
Mr. Jas. Col. Bros.

In abbreviating the names of organizations, the periods are usually omitted.
UNESCO NATO RCAF CMA GSC

but U.S.A. U.S.S.R.

The period that marks an abbreviation is never omitted before a mark of sentence punctuation, except when the abbreviation comes at the end of a sentence.
The firm of Allan and Co., of which I am a partner, has its head office in Ottawa.
I was made a partner in the firm of Allan and Co.

(c) At the end of a chemical formula when the formula completes a sentence.

(d) In series, to mark an ellipsis: something left out of a sentence. If the ellipsis comes in the middle of the sentence, three periods are used; if it comes at the end of a sentence, four.
"Bring forth the best robe and put it on him and put...shoes on his feet."
"Bring forth the best robe and put it on him...For this my son was dead and is alive again; he was lost and is found."

The Period is Not Used:

(a) After display lines and titles.
How to Retire and Enjoy It

(b) After paragraph headings on separate lines.
Uses Detailed

(c) After box headings in tables.
Canadian Exports 1961

(d) After date lines and signatures.
October 10, 1910 Allan J. Moore

(e) After contractions
Ass'n, Cont'd

The Colon

The colon is a valuable punctuation mark but it is neglected today, perhaps because few people know how to use it properly. It ranks in value between a period and a semicolon: it indicates a pause, or degree of separation, longer than a semicolon but shorter than a period.

The Colon is Used:

(a) Between two sentences that present contrasting ideas.

"These are not dark days: these are our great days — the greatest days our country has ever lived."

—Winston Churchill

"I hate nobody: I am in charity with the world."

—Jonathan Swift

(b) To introduce a formal statement, or a statement that explains, proves, or enlarges on one that precedes it. In this case, the colon acts as a substitute for a word like *for, viz.,* or a phrase like *that is to say.*

When I was a boy, my conduct was shaped by two simple principles: my father's word was law, and a child's first duty was unquestioning obedience.

(c) To introduce a formal quotation.

Mr. Carlisle listened to the address of thanks and then said: "It has been a pleasure to hold this office because I have received such generous co-operation from all of you."

(d) To introduce a series of particulars, such as a list.

The new tariff will affect a number of products of interest to Canadian exporters: newsprint, mechanical wood pulp, aluminum manufactures, plywood panels and polystyrene.

(e) After the salutation in a formal letter and also after the introduction in a written speach.

My dear Mr. Prime Minister:
Reverend Sir:
Mr. Chairman, Ladies and Gentlemen:

(f) Before a final clause that summarizes preceding matter.

"The great secret, Eliza, is not having bad manners or good manners or any other particular sort of manners, but having the same manner for all human souls: in short, behaving as if you were in Heaven, where there are no third-class carriages, and one soul is as good as another."

—George Bernard Shaw

The Semicolon

The semicolon comes third in the descending order of punctuation: period, colon, semicolon, comma. It indicates a pause or degree or separation less than a colon but more than a comma. It is also being used increasingly between clauses of a sentence when *and* or other connecting words are left out.

The Semicolon is Used:

(a) To separate statements that are too closely related in meaning to be written as separate sentences.

The committee made plans for its activities in the coming year; it will carry out an extensive campaign this winter.

(b) To separate clauses of a sentence where the connecting conjunction is omitted.

In Ottawa there are many federal civil servants; in Woodstock only a handful.

(c) To separate principal clauses in a long sentence from phrases or subordinate clauses marked off by commas.

As John quickly discovered when he tried it, the way up the cliff was steep and slippery; when, with difficulty, he had gained the top and started down again, the descent proved just as trying.

In May the Government will take steps to restrict imports of ammunition, including lead shot and cartridges; alcoholic beverages, including those made from sugar cane; all sorts of chemicals, including raw materials for plastic products; unspecified drugs and medicines.

(d) Between the clauses of a compound sentence when there is a contrast of ideas.

"The practice of medicine is an art, not a trade; a calling, not a business; a calling in which your heart will be exercised equally with your head."

—Sir William Osler

The Comma

The comma is perhaps the most widely used punctuation mark. Frequently it is overworked and made to take the place of other punctuation. Modern practice favors using commas with restraint. Fowler, an authority on English usage, says: "It is a safe statement that a gathering of commas (except on certain lawful occasions, as in a list) is a suspicious circumstance."

The Comma is Used:

(a) To set off nouns of direct address.
It seems to me, Mr. Chairman, that the duties of this committee might well be more clearly defined.

(b) As a rule to mark off an introductory adverbial clause from the rest of the sentence but not if the clause is short and no misleading would result from the omission.
When I cash the bonds I shall have enough money to make the down payment on the new house.
When the bell stopped ringing the children went in two by two.
but When the glaze is worn off, the inner surface becomes absorbent.

(c) To mark off or enclose a *commenting* relative clause; a *defining* relative clause is never set off by commas. This distinction appears difficult but really is not. A *defining* relative clause contains some information that is essential to the meaning of the sentence; a *commenting* clause contains additional information that is not essential.
The man who found the missing letter has been employed as a confidential messenger for nearly thirty years. (The defining clause, "who found the missing letter," takes no commas).

The man, who will reach the age of 65 next year, has been employed as a confidential messenger for nearly thirty years. (The commenting clause, "who will reach the age of 65 next year," contains no essential information and is set off by commas.)

(d) Between co-ordinate clauses when they are linked by simple co-ordinating conjunctions such as *for, or, nor.*
Let us make the most of today, for tomorrow may never come.

But if the clauses are long and already contain commas, a semicolon is used to separate them. (See section on the semicolon).

(e) To separate words and phrases in a series, particularly when they have the same construction.
"The great business of life is to be, to do, to do without, and to depart."
—John Morley

If an adjective is closely related to the noun, it should not be marked off by a comma.
The only wealthy white woman in the area was an elderly American.

(f) To mark off nouns in apposition, provided that they are not defining.
The young lady you met, Marion Talbot, lived in India for some years.

(g) To set off parenthetical words and phrases from the other parts of the sentence, when parentheses or dashes are not used for this purpose. In such instances commas are used in pairs, just as parentheses would be.
The Indian peasant, as you no doubt know, relies on rural money-lenders to finance him until his crop comes in.
If you feel, however, that you can't wait until the storm is over, at least take my umbrella.

But parenthetical expressions such as *also, of course, in fact, perhaps, indeed, therefore, at least, nevertheless* and *likewise* need not be enclosed within commas, nor followed by a comma when they come at the beginning of a sentence unless the comma is needed for emphasis.
Mr. Jones has had a severe attack of laryngitis. Nevertheless he will continue his speaking tour on Friday.
You, of course, will go. (Commas needed for emphasis.)

(h) To set off adverbs and adverbial phrases that modify a whole clause.
Once again, German commercial aircraft are taxiing down runways in a number of countries and passengers are booking flights with a revived Lufthansa.

(i) To indicate the omission of a word that is common to two parts of a sentence.
In 1953 there were 14 applications, in 1954, 27, and in 1955 so far, only 10.

(j) Between the day of the month and the year, but not between the month and year alone.
June 1, 1905 June 1947

(k) Between titles and degrees used with names.
John Jones, M.A., Ph.D.

(l) To separate two words or numbers that might otherwise be misunderstood.
In November 1916, 305 000 men enlisted.

The Em Dash

The dash is a useful punctuation mark but it is often overworked. The writer who does not or cannot choose the proper punctuation sometimes sprinkles his copy with dashes as a substitute. Excessive use of the dash marks the amateur.

The Dash is Used:

(a) As the equivalent of, or as a substitute for, marks of parenthesis. A pair of dashes sets off material in parentheses more directly and decisively than a pair of commas, or material that is briefer or less important than that enclosed in parentheses.
I think that Miss Jones — I always call her that in office hours and Lillian when I meet her socially — would make a first-class private secretary.

(b) To mark an unexpected turn of thought, particularly one that causes an abrupt break in sentence structure.
"The Englishman must not express great joy or sorrow or even open his mouth too wide when he talks — his pipe might fall out if he did."
—E.M. Forster

(c) To mark the insertion of material that explains, complements, or corrects.
Deep down in the earth the miners toiled — toiled for long hours, in semidarkness, with danger always present.

(d) To mark an addition outside the regular structure of the sentence.
If only he had lived — but such speculations are always useless.

(e) To gather up the subject of the sentence when the sentence is a long one. Sir Ernest Gowers says: "After the long loose canter of the subject, you need to collect your horse for the jump to the verb."
Rich stores of minerals, good agricultural land, forests stretching over millions of acres, coastal waters teeming with fish, and energetic and enterprising people — all these assure Canada a bright future.

(f) To precede a credit line for a photograph or author.
—Photo by Smith

The Dash is Not Used:

Immediately after a colon, semicolon or comma.

Quotation Marks

See section beginning on page 47.

The Question Mark

The Question Mark is Used:

(a) At the end of any sentence that is a direct question.
How long does the new radio program take?

(b) After every direct question of a series that makes up a single sentence.
"What is your name? your place of birth? your age? your height? your weight?" barked the sergeant to the new recruit.

(c) Enclosed in parentheses, to express a doubt about the correctness of what has gone before.
Mr. Schwartz, a refugee from Nazi persecution (?), applied for the position last week.

The Question Mark is Not Used:

(a) After indirect questions.
The policeman asked me which way he had gone.

(b) If the sentence is technically a question but actually a request.
Will you please reply by return mail.

The Exclamation Mark

The Exclamation Mark is Used:

(a) After true exclamations, which express surprise, fear or some other emotion.
"How dare you ask me that!"
"Fire is the best of servants; but what a master!"
—Thomas Carlyle

(b) Occasionally, enclosed in parentheses, to indicate irony.
Mr. A. asserted that never in his long and arduous (!) political career had he taken a bribe.

(c) After interjections, such as *oh, ah, ha,* etc. When these exclamations come in a series, they are separated by commas and the exclamation mark put after the last.
Several hon. members: "Hear, hear!"

The exclamation mark should always be used with restraint.

Parentheses and Brackets

Parenthesis means literally "an insertion beside": something outside the basic meaning of the sentence. The sentence is logically or grammatically complete without the material contained within the parentheses.

Parentheses Are Used:

(a) To set off words of explanation or comment, or an afterthought.
When the news of Johnson's death reached Brattleboro (the farm he owned lies on the west bank of the river about three miles away), the townsfolk decided to hold a memorial service.

(b) To indicate something that is indirectly related to the thought of the sentence but not actually connected by construction with it.
The only comfort I can give him (cold comfort, I am afraid, because the championship is lost) is to say that he put up a good fight.

(c) To enclose letters or numbers designating items in a series, either at the beginning of a paragraph or within a paragraph.
(1) (2) (a) (b)

Brackets May be Used:

(a) In printed matter, to enclose material inserted into a text by an editor or critic, not the author.
The chairman of the board recently pointed out (see speech printed in the company's annual report) that exports to Britain this year are rising.

(b) To enclose such phrases as (to be continued), (continued on page 10), (sic).

(c) To enclose translations of titles.

(d) To enclose second set of parenthetical material inside material already enclosed by parentheses. If this second material is slight, such as an initial or a number it may be enclosed in a second set of parentheses instead.
(See Smith's (1967) reference to.....).

The Apostrophe

The Apostrophe is Used:

(a) To indicate the omission of letters or numerals.

e'er	ever
doesn't	does not
'55	1955

Be careful to distinguish between *it's* as a contraction of *it is*, and *its*, the possessive pronoun. The first takes the apostrophe; the second does not.

(b) To form the possessive of nouns not ending in an *s* or *z* sound.
men's children's dog's

If the noun ends in an *s* or *z* sound, the apostrophe alone is used for the possessive.
Jones' Moses' provinces' forests'

Some authorities favor the use of another *s* for proper names of one syllable.
Jones's St. James's

The apostrophe is often omitted in instances where the word is not used in a truly possessive sense.
Canadian Exporters Association
Department of Veterans Affairs
several minutes delay
seven days leave

Order of Punctuation

Double punctuation is used only with abbreviations, quotation marks, run-in side headings, parentheses and brackets. Difficulty sometimes arises over the order of the punctuation marks when double punctuation is needed. In abbreviations, the period marking the abbreviation comes first and the punctuation mark second. If the abbreviation comes at the end of the sentence, no final period is needed. In run-in side heads, the period may be followed by a dash. For the practice followed with quotation marks, see the chapter on "Quotations." In using parentheses, if the material enclosed in the parentheses makes a complete sentence, the period goes inside the closing parenthesis; if it forms only part of the sentence, the period goes outside. The same rule applies when using brackets.

Quotations

The exact words of a speaker or writer are indicated by the use of quotation marks or by a variation in type or indention. In the latter methods no quotation marks are used. Whichever method is used, the author must reproduce in every detail the spelling, punctuation and other characteristics of the original, even to the extent of reproducing errors, though he may call attention to such mistakes by writing *sic* (Latin for *so*) in brackets, thus: *sic* immediately after the error. Other interpolated matter must be enclosed in brackets.

1. Quotation marks are used to enclose direct quotations. They are not used with indirect quotations.
   John said, "They have gone."
   John said that they have gone.

   Quotation marks are also used around interrupted or fragmentary quotations.
   "I have no idea", he said, "what you are going to do about it."
   The adjudicator commended the little pianist for her "perfect rhythm."

   If the meaning so dictates, the resumed section of the quotation may be capitalized.
   "His imagination resembled the wings of an ostrich," wrote Thomas Babingtton Macaulay. "It enabled him to run, though not to soar."

2. When a quotation comprises several consecutive paragraphs, use quotation marks at the beginning of each paragraph and at the end of the last one. The same rule applies to consecutively quoted stanzas of poetry.
   "The paragraph is a convenient unit; it serves all forms of literary work. As long as it holds together, a paragraph may be of any length — a single, short sentence or a passage of great duration.
   "If the subject on which you are writing is of slight extent, or if you intend to treat it briefly, there may be no need of subdividing it into topics. Thus, a brief description, a brief book review, a brief account of a single incident, a narrative merely outlining an action, the setting forth of a single idea — any one of these is best written in a single paragraph. After the paragraph has been written, examine it to see whether subidivison will improve it."
   —Strunk and White

3. Double quotation marks are used for the main quotation, single ones for inside quotations, and double ones for a third quotation within the matter between single quotation marks. Quoted matter ought rarely to go beyond the third set of quotation marks.
   "I think that Agnes Repplier's 'But who shall say that a hundred dollars a minute is beyond the "order of reason"?' is most apt for your purposes," said the professor.

4. Titles of chapters, articles, essays, lectures and short poems are placed in quotation marks. But titles of books, plays, newspapers and magazines given in the text are usually italicized.
   I read Sam Jones' article "Modern Electronics" in the magazine *Science Wonders*.

5. Quotation marks are used to enclose technical terms in nontechnical writing, colloquial words in formal writing, nicknames, slang, coined or humorous words. If the term or word is repeated in the same writing, the quotation marks are no longer required. It is modern practice to use single quotation marks in these instances.
   The ore will have to be 'upgraded' to make mining profitable.
   Government policy in the matter has been to 'play it down'.
   Many 'experts' were called into consultation. (The word 'experts' is used here in an ironical sense).

6. Matter following the terms *entitled, marked, specified, as, endorsed, signed, indicated as, mentioned as, termed, the word, the term*, is usually either enclosed in quotations or put in italics.
   The parcel was marked "Fragile".
   He signed his name "John Jones."

7. When a footnote reference is given to the source of a quotation, the reference index number should follow immediately after the quotation marks.
   "If we open a quarrel between the past and the present, we shall find that we have lost the future"[1].
   —Winston Churchill

8. Quotation marks are not used around a proper name, a firm name or a slogan.
   The man on the right is John Davidson of Ajax Steel Limited.
   The poster should illustrate the slogan Be Kind to Animals.

Quotation marks are not used to enclose familiar expressions like *a Daniel come to judgment* that have become part of the language.

9. Modern practice in the use of quotation marks with other punctuation marks tends to place the comma and the final period inside the quotation marks.
   "Study carefully," he said, "the section on 'Engineering,' which appears at the end of the book."

Other punctuation marks are placed inside the quotation marks only if they form a part of the matter quoted, as follows:

(a) Interrogation and exclamation marks are placed inside or outside the quotation marks according as those marks do or do not belong to the quoted matter.
Is the question "What are we doing?" or "What are we going to do?"?

(b) The dash is placed inside the quotation marks when it stands for something left unsaid, and outside when it is used as an ordinary punctuation mark.
"Oh, how I wish—," he exclaimed.
"It would be better not to go ahead with it," he said—"the plan may be an utter failure."

(c) Parentheses are placed outside the quotation marks when the parenthetical clause is quoted, otherwise inside.
His very words ("I owe them nothing") indicated his feelings in the matter.
"I realize (and with shame)," he wrote, "that I have neglected them."

10. The quotation is separated from the rest of the sentence by commas unless the meaning requires other punctuation.

11. The too frequent use of quotation marks mars the appearance of a page. This may be overcome by using instead small capitals, italics, variations in indention and other changes in type style.

SPELLING

General Rules. Spelling depends largely on memory. Sound is no guide in recognizing single or double consonants and the rules are so irregular that it is necessary to memorize the exceptions as well as the rules. The best way to learn is to be observant when reading.

Words frequently misspelled are:

accommodate	embarrass	precede
arctic	gauge	rarefy
consensus	harass	sacrilegious
desiccate	inoculate	separate
dietitian	liquefy	supersede
diphtheria	naphtha	unparalleled
disappoint	paraffin	vilify

Some rules and exceptions are given here.

Words with *ei* and *ie*

The jingle "*I* before *e* except after *c* or when sounded as *a* as in *neighbor* and *weigh*" covers the rule.

Exceptions:

financier	height	seize
foreign	leisure	sovereign
heifer	neither	weird

Words ending in *cede* and *ceed*

Supersede is the only word ending in *sede*. *Exceed, proceed* and *succeed* are the only common verbs ending in *ceed*.

***Able* and *ible* endings**

There is no basic rule for the *able* and *ible* endings, but if there is a corresponding word ending in *ation*, the ending is usually *able*; if ending in *sion* or *tion*, the ending is more often *ible*.

duration	durable
division	divisible

Final consonants doubled before a suffix

Double the final consonant in words of one syllable ending in a consonant preceded by a vowel.

bed	bedded
dip	dipper
fit	fitted
sit	sitting

Exception: Do not double the final consonant before a suffix beginning with a consonant.

fit	fitful
sad	sadness

The final consonant is usually doubled in words of more than one syllable ending in a consonant preceded by a vowel, if the accent is on the last syllable and the suffix begins with a vowel.

acquit	acquittal
occur	occurrence
rebel	rebellion
regret	regretted

Exceptions:

avoid	avoidable
behead	beheading
chagrin	chagrined
refer	referable

Final consonants not doubled before a suffix

For words ending in a consonant preceded by a vowel, and NOT accented on the last syllable, do not double the final consonant before a suffix beginning with a vowel.

abandon	abandoned
benefit	benefited
cater	catering
label	labeling
market	marketable
parallel	paralleled

Exceptions: certain words with equally accented syllables:

handicap	handicapped
sandbag	sandbagged

For words ending in a consonant preceded by a vowel, do not double the final consonant before a suffix beginning with a vowel if the accent is shifted to a preceding syllable.

confer	conference
prefer	preference
refer	reference

For words ending in a consonant preceded by more than one vowel, do not double the final consonant before a suffix.

breed	breeding
broil	broiled
cheap	cheapest

Words ending in two or more consonants usually remain unchanged when a suffix is added.

call	called
cost	costing

Combinations with *all*

The final *l* is usually dropped when *all* is used as a prefix.

all together		altogether
	But	all right

Words ending in *e*

Words ending in a silent *e* usually drop the *e* before a suffix beginning with a vowel.

age	aging
debate	debatable
dine	dining
love	lovablew
subdue	subduing

Exceptions:

courageous	peaceable
dyeing	shoeing
hoeing	singeing
mileage	toeing
noticeable	

Words ending in a silent *e* generally retain the *e* before a suffix beginning with a consonant

complete	completeness
hope	hopeless
waste	wasteful
whole	wholesome

Exceptions:

abridgment	judgment
acknowledgment	wholly
argument	wisdom
duly	

Words ending in *c*

For words ending in *c* with the sound of *k*, add *k* before *i*, *y* or *e*.

picnic	picnicking
panic	panicky
traffic	trafficked

Verbs ending in *ie*

Verbs ending in *ie* change *ie* to *y* before *ing*.

die	dying
lie	lying
vie	vying

Words ending in *n*

When the suffix *ness* is added to a word ending in *n*, the original *n* is retained.

clean	cleanness
green	greenness
keen	keenness
sudden	suddenness

Spelling (Selected List)

abyssal
accommodate
acknowledgment
active layer
aerial – from the air
AFM diagram
airborne (magnetometer)
airphoto, but aerial photograph
alignment
alkali feldspar (no hyphen)
alkalis (not alkalies)
allochthonous
alluvial fan
all right (*not* alright)
all-terrain vehicle (ATV)
anaerobic
analogous
analysis (sing.), analyses (pl.)
analyze
apex (sing.), apices (pl.)
appendix (sing.), appendixes (pl.)
Arctic, *as* the Canadian Arctic, *but* an arctic environment
Archean
areal – pertaining to area
armour
ash flow
a.s.l. (above sea level), etc.
axial plane cleavage

B.P., B.C., A.D.
backshore, backslope, backwash, backwater
badlands
bankfull discharge
basal till
base level, base metal, base line
b axis, b direction (no hyphen)
bay head, bay ice, bay mouth bar
bedding plane fault
bed load
bedrock
bell-shaped distribution
bench mark
b horizon
block fault
blowout
borderland
boreal (adj.), boreal region cf. Arctic
borehole
bottomset
boudinage (noun not verb)
brackish water
break of slope, break in slope
breakup
breakwater
byproduct, bypass
burned over

^{14}C
calc-arenite
cannot
canvas (cloth); canvass (political)
caprock
catastrophic
cave in
centre point, central, centring
channel, channelling
channel flow
channel mouth bar
characterize
circum-Pacific
clay belt
clay boil
clay size (n.), *but* clay sized particles (adj.)
cloudburst
coalfields, coal measures
coarse grained
coastal plain
coastline, cliffline, snowline
collinear (*not* co-linear)
colour, coloration, colorimeter
compressive strength
consensus
conspecific (*not* cospecific)
co-ordinate, co-operate, coexist
corehole
crag and tail
crossbed, crosscut, crosslaminate
cross fault, cross fold
cross-stratification, cross-section
crystallize
cut and fill
cutbank
cutoff

damsite
dark coloured
date line; base line
datum (sing.), data (pl.)
deep sea sediments
delta fan, delta front (n. and adj.)
dependent (adj.); dependant (noun)
desiccate
desirable
develop
dip slope
disappoint
disc (not disk)
dissect
downdip, downstream, downdropped, downslope, downthrown, downfaulted
down-ice (adj.)
draft (*not* draught)
drag fold
drift-covered (adj.); *but* the area is drift covered
drill core, drill bit
drillhole (*but* diamond-drill hole)
discrete (individually distinct)
disseminate
dyke (*not* dike)

Earth (planet); earth (material)
earthflow
echo sounder, echogram
embarrass
embedded
enclose
encrustation (*not* incrustation)
en route (*not* enroute)
eolian
existence
exaggeration
exponential
extraglacial

fall line
fallout
fast ice
fault block mountain
feldspar
feldspar porphyry
felsenmeer
ferromagnesian
fetid
fieldwork
fine grained *but* medium- to fine-grained granite
fiords
flatland
flight line
floodplain, floodwater
flowslide
flowtill
fluvioglacial
focused (*not* focussed)
footnote, footwall
foregoing and forgoing are two different words
foreslope, foreland, foredeep
freeze and thaw
freezeup
freshwater
frost heave, frost table

gamma ray
gastropods
gauge
geological (*not* geologic)
glacial lake
glacial Lake Iroquois
glaciolacustrine
grain size
green-grey, greenish grey
grey (*not* gray)
greywacke
ground ice
groundmass
groundwater
groundwork
guidebook
gully (*not* -ey); gullies

half life, half width
halfway
halo, haloes/halos
hanging wall
harass
hardpan
hardwood
headland
high grade
high water mark
hillside, hilltop
hinge line
homogeneous, homogeneity
hoodoo
hotspring, coldspring
Hudson Bay (*but* Hudson's Bay Company)
hydroelectric

iceberg, icefall
ice cap, ice dam, ice field, ice sheets, ice front
impassable (*not* -ible)
inasmuch as
incise
index, indexes (*but* indices for specialized usage)
infrared
in situ
in so far as
instalment, installed, installation
interglacial, intertidal
interstice (n.), interstitial (adj.)
intraclast, intraformation
iron formation

joint plane

kame and kettle (topography)
kettle hole

labour (*but* laborious)
lake basin
lakebed, lakefront, lakeshore, lakeside
landform, landmark, landmass, landslide
land ice
landlocked
lens, lenses
leuco-quartz diorite (*but* leucodiorite)
licence (noun); license (verb)
limy; the mineral makes limy, the fruit limey
lineament

liquefaction, liquefy
lodgment till
longshore

mainland
maintain (*but* maintenance)
man-made
map area, map sheet, map unit
meagre
meantime
medium grained, medium bedded
mélange
megafauna
meltwaters
metavolcanic (*but* meta-andesite)
meter (instrument)
metre (SI unit)
microfauna
midpoint (*but* mid-Paleozoic)
milepost, milestone
mineable
mollusc
mould (*not* mold)
mountainside
mud boil, mud crack, mud ball, mud flat
mudflow, mudslide, mudstone
multicoloured

naphtha
nearby
nearshore
nonmarine, nonglacial, nonsorted
northeast (*but* north-northeast)

occurrence
offset, offshore
oil sands
olive-green (*but* dark green)
one half, one third
ongoing
onshore
open water
orebody
ordinarily
outcrop (verb) (*not* crop out)
outgoing, outflow, outwash
overall
overlie (verb) (*not* overly)
override, overrun
overthrust, overturn
oxidized (*not* -ised)

pack ice
paleontology
Paleozoic, Paleocene
paragneiss (*but* para-andesite)
parallel
pay zone
pebble conglomerate (*but* quartz-pebble conglomerate)
penecontemporaneous
peneplain (noun), peneplaned (verb)
per cent (*from* per centum)
percentage
persistent
pinch-out (noun)
pipeline
plateau, plateaus
postglacial, posttectonic
post-Paleozoic
pothole
practice (noun); practise (verb)
Precambrian
precede (*not* preceed)
pre-Devonian
pre-existing
preglacial
preoccupy
preventive
proceed
proglacial, prograde, prodelta
program

quartz arenite
quartz diorite
quartzofeldspathic
quartz porphyry
quicksand

radioactive
rainwater, rainfall, *but* rain gauge
rare-earth
rarefy
readvance
recognize
re-cover (a land surface) not recover
recurrence
redbeds
re-entrant
re-formed (crystals) not reformed
re-fused (rocks)
relict
resistance, resistant
résumé
rigour, rigorous
ripple marks, ripple bedding, ripple crosslamination
riverbank
river bed, river bottom, river valley
roadbed, roadcut, roadside, roadway
rockslide, but rock type, rock unit
role
runoff

saltwater
sandbank, sandbar, sandspit
seawater, seabottom, seafloor, sea ice, sea level (all "sea" words one word as noun & adj. with exceptions, e.g. sea ice, sea level)
seismic wave
selvage
semiarid, semicircular
severely
shaly
shoreline, but shore ice
shortwave
shothole
sideroad
side-scan sonar
sidewall sampling
siliceous
skis, skiing
slack water
slip-off slope
snowbank, snowdrift, snowfall, snowline, snowpack
snowfield (*but* ice field)
softrock
stillstand, stillwater

stockwork
stony (*not* stoney)
strandline
stratovolcano
streamflow
sub...most words formed with the prefix "sub" are one word – subaerial, subbottom, subcrop, subsurface
sub-ice, subunit
sulphur, sulphide
supersede
supercool, superfamily
surmise
symmetrical, symmetry

tableland
terrain (topography), but a gneissic terrane
testhole
thick bedded
thin section
thrust fault
tidewater
timberline
today, tomorrow, tonight
topsoil
treeline
trimline
twofold

ultrabasic
ultraviolet
undercut, underlie, underestimate, underwater
unparalleled
undip, upslope, upstream, upvalley
up-ice (adj.)
usable

valley bottom, valley fill, valley floor
valleyside
vapour
vigour, vigorous
volcano, volcanoes
V-shaped

wall rock
washout
watercourse, waterfall, waterline, watershed, waterway
water level, water table, water well
wavelength
well developed, well rounded, well sorted (adj.)
whichever
widespread
windfall, *but* wind gap and water gap
worldwide
worth while

X-ray

USAGES

Words and Expressions Commonly Misused

Advise, offer counsel to; *not* notify, inform, announce.

Agenda is plural – the singular is *agendum* – but has been accepted as a singular word and takes a singular verb.

Aggravate, to increase or intensify, make worse, *not* to annoy.

All (of). Omit the *of*.

All ready, adjective phrase: "When the whistle blew they were *all ready*", *already*, adverb, means by this time.

All right, idiomatic. The form *alright* should never be used.

Allude, refer indirectly (to); *elude*, escape from.

Allusion, an indirect reference; *illusion*, unreal image or false impression.

Alternate(ly), by turns; *alternative(ly)*, in a way that offers a choice (originally, between two things).

Amount, total; *number* (noun) refers to collective units. *Amount of money, number of errors.*

Anticipate, forestall by prior action, foresee, *not* expect.

Anxious, properly used only when anxiety exists, otherwise use *eager*.

Appear suggests that which is visible. A person *appears* to be young but *seems* to be intelligent.

Appreciate, to place value on, ought to be used with a noun as object, e.g., "I appreciate your kindness," and never with a *that* clause.

Apt, having a tendency (to) because of the subject's character (*apt to take offence*); *liable* expresses probabilities that the subject will suffer something undesirable; *likely*, probable.

Around means on every side, enveloping, and should not be used to mean *about*.

Background means only ground beyond the chief objects of contemplation, or in a less prominent position. Do not use in phrases such as *educational background*, or to replace *explanation, history, origins*, etc.

Begin is preferable to *commence* except in legal usage.

Biannual means *once every two years*. The term *semiannual* denotes *twice each year*. So with *bimonthly* and *semimonthly*, and other similar terms.

Biennial (Bot.), existing for two years; springs from seed one year, and flowers and dies the next.

Billion. In British usage this word signifies a million million; in United States usage it signifies a *thousand million.* The use of thousand million avoids all ambiguity.

Blocs, combinations of parties, nations, groups; *blocks*, pieces of wood.

But is unnecessary after *doubt* and *help.*

Claim means only *lay claim to.* Do not use as substitute for *declare, maintain* or *charge.*

Cohort is a band of warriors (or persons). Do not use to refer to one person.

Commence. (See *Begin).*

Compose, make up, constitute (most frequently used in the passive: be composed of); *comprise* (literally *embrace*), include, consist of. Note that the preposition *of* is included in the verb *comprise* but not in *compose.* A body comprises the elements of which it is composed; the elements do not comprise the whole.

Comprise implies inclusion of all parts of a whole; *include* implies that there may be other parts not mentioned. Compare "The Dominion of Canada then (1867) comprised the provinces of Ontario, Quebec, New Brunswick and Nova Scotia" and "The Dominion of Canada, as constituted in 1867, included the provinces of Ontario and Quebec."

Consensus means shared opinion, agreement in opinion; do not say *consensus of opinion*; use one or the other.

Consist of denotes the substance of which the material is made, and is a synonym for *composed of*; *consist in* defines the subject ("The work *consists in* addressing envelopes") and is a synonym for *have its being in.*

Contact. Say *get in touch with*, or *look up, find, meet.*

Continual, frequently recurring; *continuous*, without intermission.

Dates. Instead of such expressions as *last year, next year*, the year should be specified. Delay in publication may make the reference erroneous.

Decimate means reduce *by* one-tenth, not *to* one-tenth (originally, to take out one-tenth); hence *decimate by twenty per cent* is incorrect.

Defective (from *defect*) is appropriate to what is wanting in quality; *deficient* (from *deficit*) to what is wanting in quantity.

Definite and *definitely.* Do not use unless you are sure that you could not express your meaning properly without them. They mean exact(ly), precise(ly).

Dependant is the noun, *dependent* the adjective. Do not omit the *on* or *upon* after *depend* and *dependent.*

Deprecate, express disapproval of; *depreciate*, lower the value of.

Different. Say *different from*, never *different than.*

Dilemma is not a synonym for *difficulty.* It means to be faced with a choice between two equally unfavourable courses of action.

Directly is an adverb meaning *instantly, immediately*, not a conjunction equivalent to *as soon as.*

Disassociate. Use *dissociate.*

Donate is not the equivalent of *give*; it means *present with.*

e.g. (exempli gratia) means *for the sake of example* and introduces an illustration; *i.e.* (id est) means *that is* and introduces a definition.

Endorse should not be used in the sense of *corroborate, subscribe to, be in agreement with.* It means *confirm, ratify.*

Enormity does not mean *bigness* but *monstrous wickedness.*

Entail, impose (labor, expense) upon, involve; is often used where no verb is necessary and often where *need, cause, impose, necessitate* or *involve* should be substituted. See *Involve.*

Equally as. Omit *as* (not *equally as good*, but *equally good*).

Euphemism, a mild expression used in place of a stronger one; *euphuism*, high-flown style.

Except. Except that, as a conjunction introducing a clause, is better replaced by *unless* or *if not.*

Few, a few. *Few* emphasizes the fact that the number is small; *a few*, the fact that there is a number.

Fewer is used when referring to number; *lesser*, when referring to quantity, amount, size. But do not join *fewer* to the word *number* (fewer number).

First two should be used, not *two first.*

Firstly. First is a better form for the adverb.

Fix means *make firm, place definitely.* Avoid its use to mean *arrange, prepare, repair.*

Following should not be used as a preposition as a substitute for *after, as a result of,* but only as a participle, when it agrees with a noun or pronoun. "Such success, following the careful preparations, was to be expected."

Forecast. The past tense and past participle is *forecast,* not *forecasted.*

Fulsome, disgusting by excess, *not* full of, exceedingly.

Got. Avoid the use of *have got* where *have* alone will express your meaning. But Gowers says "It is better to say 'I have got the information you wanted' than 'I have obtained the information that you desired'." Never use *gotten.*

Hard hit, won, earned; not *hardly hit,* etc. *Hard* is the adverb of the adjective *hard. Hardly* is used only in the sense of *scarcely.*

Highlight(s). Reserve the use of this word for a moment or detail of vivid interest.

However. Avoid starting a sentence with *however* when the meaning is *nevertheless.*

Hung. The proper form applicable to capital punishment is *hanged.*

Ideal cannot be compared. *More ideal* is impossible.

i.e. (id est) means *that is* and introduces a definition; *e.g.* (exempli gratia) means *for the sake of example* and introduces an illustration.

If and when. One of these words is usually sufficient.

Imply and *infer* are not interchangeable. A writer or speaker implies what his reader or listener infers.

Including implies that the list that follows is not complete. Where the list is complete, use *comprising.*

Inculcate. We inculcate ideas into people, not people with ideas.

Individual is not equivalent to *person;* it refers to the single members of a group as opposed to the whole group.

Inform. Tell is preferable. *Inform* cannot be used with a verb in the infinitive.

Insanitary implies danger to health; *unsanitary,* lack of sanitary equipment or conditions.

Inside of is correct only when used adverbially to mean *in less than* (inside of a week).

Intense, existing in a high degree; *intensive,* directed to a single point or area or subject.

Involve originally meant *wrap up in anything, envelop, enfold* but is often now used in place of *include, contain* or *imply* and often superfluously. Omit where possible; otherwise use a more specific word.

Last, final; *latest,* most recent.

Least is the superlative of *little,* of which the comparative is *less.* It is incorrect to use *least* when referring to only two persons or things. (He is the less efficient of the two supervisors.)

Leave. Do not misuse for *let.*

Less should not be misused for *fewer. Less* refers to degree, quantity or extent, *fewer* to a number. *Less* takes a singular noun (less choice), *fewer* a plural noun (fewer choices).

Liable should not be used in the sense of *likely.*

Likely, probable. *Likely* does not imply any suggestion of habit or that the probability arises from the character of the subject (see *apt*).

Limited. Do not use as a substitute for *few, small, meager, inadequate, scant.*

Line. Along these lines, meaning *in this way, course of procedure,* is an overworked phrase and should be avoided.

Literally means *with words taken in their usual sense* and should not be used when you mean *figuratively, metaphorically.* Do not use *literally* in a metaphor.

Loan. Use *loan* only as a noun; the verb is *lend.*

Loaned. The better form is *lent,* past participle of *lend.*

Masterly, very skillful, characteristic of a master; *masterful,* self-willed, imperious, arbitrary.

Media is the plural of *medium* (agency, means). Use the singular when only one agency is meant.

Meticulous means over-careful about small details and should not be used as a synonym for *scrupulous* or any other word implying commendation.

Militate (of facts), have force (*against,* rarely *in favor of*); *mitigate,* appease, reduce severity of, moderate.

Mutual means *reciprocal* (used of two individuals acting on each other). In other circumstances *common* is the appropriate word.

Next two should be used; not *two next.*

Not to exceed. Except in specifications and similar work, *not more than* should be used.

Oldest and *eldest* are both superlatives of *old, oldest* being the most recent form. *Eldest* is now reserved to refer to the first-born in a family. So also the comparatives *older* and *elder.*

One of the most. This construction is overworked; avoid it. But if you use this expression, do not make the mistake of using a singular verb in the relative clause that follows it. "One of the most exotic sights that confront the tourist."

One of those who. Use a plural verb after *who.*

Optimistic is derived from the Latin *optimus* (best) and should not be used as a synonym for *hopeful* or *cheerful.* Reserve its use to express the habit of hoping for the best at all times.

Oral, spoken by word of mouth; *verbal,* in words, whether spoken or written.

People is best not used with words of number, when *persons* ought to be used. Strunk says: "If of six people five went away, how many people would be left? *Answer*: One people."

Per is a Latin preposition and should be confined to its own language, e.g., *per cent.* Say "Four cents a mile," not "four cents per mile."

Persuasive, able to persuade; *pervasive,* spreading through, saturating.

Phase means stage of transition or development, not *aspect.*

Phenomena is the plural of *phenomenon.*

Practicable, that can be done, feasible; *practical,* applicable in practice, the opposite of theoretical. (The opposites are *impracticable* and *unpractical.*)

Practically. Do not use for *virtually* or *almost.*

Preferable should not be compared; *more preferable* is incorrect.

Presently means *in a little while, before long, soon*; it no longer means *now, at present.*

Preventive, not *Preventative.*

Prior to (preposition). Use *before. Prior* as an adjective is correct.

Prohibit from doing but *forbid to* do.

Proportion. Use only to refer to statistics. For *a proportion of* use *some*; for *a large proportion of* use *many.*

Proposition means something put forward for discussion or as the basis of argument; it should not be used as a synonym for *plan* or *project.*

Proven. Accepted usage only in legal sense. As participle of *prove,* the form *proved* should be employed. *Proven* may be correctly used as an adjective.

Provided that introduces a stipulation (on the condition that) and is preferable to *providing.*

Reaction implies an automatic rather than an intellectual response. Reserve its use for chemical, biological and mechanical processes, and do not use in place of *opinion* or *impression.*

Relatively should be used only when a comparison is made.

Requisition (verb) is transitive. One *requisitions* a thing, or *makes requisition for* it, but does not *requisition for* it.

Resort, that to which one has recourse for aid; *resource,* a reserve upon which one can draw when necessary. "They had resort to their resources."

Respective(ly) may usually be omitted.

Responsible. Things cannot be responsible for events; they *cause* them.

Same should never be used as a pronoun, as "Shops full of goods and people ready to buy *same.*"

Secure, to get possession of (something desirable) as the result of effort; originally, to make safe; *obtain,* to acquire, get.

Strata is the plural of *stratum.* The first *a* is pronounced as in *stray.*

Substitute, to put a person or thing in place of another; *replace,* to take the place of another. *Substituted by* is incorrect; the correct form is *replaced by.*

Such a large, small (etc.). *So large, small* (etc.) *a* is preferable. (Fowler and Gowers say the "such a" construction isn't too far wrong.)

Sufficient. Use *enough.*

Therefore, consequently; *therefor,* for it, that, them.

This, that, should never be used adverbially, as *this much.*

Today is no longer hyphened.

Too, very. These words do not qualify participles directly. The word *much* should be inserted, as *too much engrossed, very much pleased.*

Toward, towards. The first form is the one now generally used as a preposition.

Transpire, in its nontechnical sense, means *become known,* not *happen.*

Unique cannot be compared (rather unique, somewhat unique).

Via means *by way of,* not *near.*

-wards. In words with this ending, the adverb usually retains the *s;* the adjective (and, following it, the noun) drops it.

Weather conditions. The word *conditions* is unnecessary.

Various Suggestions

About and approximately

Usually about can take the place of the more pretentious approximately. If there is a difference it is that approximately suggests a more careful calculation.

Abstract and concrete

Try to avoid the employment of the abstract for the concrete — a common error in writing. Terms implying geological processes, as mineralization, chloritization, granitization, shearing, faulting, etc., are abstract. Faulting cannot 'strike northeasterly', though the fault, or faults, or fault zone may. Another abstract term commonly misused in a concrete sense is values. Value is an attribute, not a substance. An ore does not 'carry high gold values', though it may contain much of that valuable metal. Nor does a miner 'encounter good values' in his ore, but may encounter valuable minerals, or minerals that carry valuable metals. Also, values are not lost in sinking, but the orebody may be lost.

Accessary, accessory

An accessary to the crime but an accessory mineral.

Accessories — see intrusives

Accuracy and Precision

Accuracy is a measure of how close a fact or value approaches the absolute or true value. Precision is a measure of the fineness of a value. Thus 1.0103 is more precise than 1.01 but it may not be more accurate.

Achieve

Achieve implies successful effort and not the mere completion of something. You may achieve a merit increase but you get a statutory raise.

Affect and Effect

The first means to have an influence and the second means to cause, produce or bring about a change.

Alternately and alternatively

The first of these words means by turns and the second means in a way that offers a choice.

Altitude and elevation

The terms altitude and elevation are essentially synonymous, and commonly imply height above sea level. However, in a narrower sense, altitude applies to the approximate heights of geographic features, whereas elevations have regard to the exact heights of such as bench marks.

And/or

This awkward construction can commonly be avoided by rewriting. "Granite and (or) schist predominate" can be rewritten "Granite or schist or both predominate".

Anyone and everyone

The following rules should be observed: anyone (everyone, no one, someone) is the correct form when the meaning is anybody, everybody, etc. Any one (every one, no one, some one) is the correct form when things and not persons are meant.

Apparent, evident, obvious

Obvious means easily seen, in the sense of discovered. Evident denotes the existence of visible signs, all pointing to one conclusion. Apparent goes one step beyond evident and implies visible signs and some reasoning, as in: "The absurdity of their contention is apparent to one who knows the effects produced by the same causes in the past."

Approximately – see about

As far as

Distinguish between: as far as Vancouver, which implies a fact, from so far as known, which implies doubt.

Assume and presume

The object-clause following assume expresses a theory or even an hypothesis whereas the object-clause following presume expresses what the presumer really believes until proven otherwise.

Below and under

Below is concerned with relative position whereas under implies superposition or subjection.

Both

Do not follow both by as well as – and is quite sufficient.

Broad and wide

That the meaning of both these words is similar is shown by their having the same opposite, narrow. Wide refers to the distance that separates the limits and broad to the amplitude of what connects them. Backs, shoulders and bosoms are broad but mouths are wide.

Carbonized, carbonated and carbonatized

It has become customary in our reports to distinguish between the terms carbonized, carbonated, and carbonatized. The first means changed to carbon; the second, charged with carbonic acid; and the last, replaced by carbonate mineral.

Case

The word case is all too commonly resorted to as a trouble-saver and results in flabby writing. The word has its use but before using case or its elegant variation instance, consider rewriting the sentence.

Characteristic, distinctive, typical

Typical, which is opposed to "individual", denotes that the thing or person markedly shows the characters peculiar to the type, class, species, or group to which it belongs. The characteristic quality of something is the one that distinguishes and identifies that thing. Distinctive denotes an individuality that sets something apart from its type or group.

Clastics – see intrusives

Common, to be common, commonly

These words are much abused. Select synonyms such as prevalent, frequently, usual, general.

Compare to and compare with

Attention may be drawn to the distinction between and common misuse of the expressions compare to and compare with. If one rock specimen is compared to another, the object is to indicate their similarity; but if one is compared with another, both their differences and similarities are given equal consideration, and the conclusion may be that the specimens bear little resemblance to each other. Any poet could be compared with Shakespeare, but few could be compared to him.

Comparatively, relatively

Do not use these words unless the comparison or relativity is clearly stated.

Comprise

The word comprise means consists of; a formation is not comprised of sandstone and shale; it comprises, or consists of, or is composed of sandstone and shale. See also under include. A whole comprises two but two constitute a whole.

Consist

Use consists of for materials and consists in for a definition or statement of identity.

Correlate

The word correlate is correctly used to indicate formations of the same age, though they may be different in lithology. A limestone formation in England, may, for example, be correlated with a sandstone formation in Alberta. The term should not be applied to separate bodies of the same formation or group, nor to what are mapped tentatively as parts of the same lithological units. Correlations may be based on paleontological or physical evidence.

Data

Data is a Latin plural. The singular, datum is seldom used and if the meaning being conveyed requires the singular, it is better to rewrite the sentence. The word "Information" can serve much the same purpose.

Definitive

This word goes a step farther than definite and introduces a concept of finality. A definite offer may state precise terms but a definitive offer presents final terms.

Develop

Develop should be used in the sense of a gradual process and is not a synonym for arise, come, happen, occur, take, place, etc. It is correctly applied in 'developing a mine', but a prospect is explored. Other words or expressions, as uncover, unfold, bring to light, disclose, increase, produce, expand, evolve, make, contrive, construct, build, establish, compose, achieve, enlarge, expand, extend, etc., can be substituted for greater clarity and with less monotony.

Differ

When used in the sense of being different differ is followed by from. When used in the sense of having a difference of opinion it is usually followed by with but sometimes by from.

Direction

North is to be preferred where a definite designation is intended as in north bank, north side, north corner, north boundary, or in north dip, north flowing. Northward or northerly are to be preferred where the designation is less precise, as in northward trending, northerly ranges. Bearings may be given by azimuth or by reference to north or south. Write 'the fault strikes 135 degrees', or 'the fault strikes north 45 degrees west'. Similarly write that 'glacial striae trend at 135 degrees', or give the direction as 'south 45 degrees east'. Avoid bearings such as north-south, northwest-southeast, or east-west in such statements as 'the folds trend north-south'; it is sufficient to note that 'the folds trend north'. Abbreviations may be used: for example, strike N32 W, dip 25 NE. Do not abbreviate 'north side of the lake'. Unless stated to be magnetic all bearings are assumed to be true. Northern – where general – northern end of the zone; western Virginia but west Virginia (a formal name).

Due to

Although the OED does not equate due to and owing to, current usage indicates that due to has become a compound preposition. 'Due to the storm the trip was postponed'.

Elevation – see altitude

Emphasis

Many writers overlook the emphasis that can be gained by rearranging the order of words in a sentence. For example, in the following sentence the emphasis is on discovery: 'The discovery of gold in the Klondike was made in 1896'. If it is desired to emphasize gold, the sentence should read: 'Gold was discovered in the Klondike in 1896'. To emphasize the Klondike the sentence should read: 'The Klondike gold discoveries were made in 1896', and, to stress the date, should be reworded to: 'In 1896 gold was discovered in the Klondike'.

Encountered

Encountered is commonly used for observed. One encounters a grizzly but observes a deformation pattern.

Essentially

Essentially means necessarily or indispensably. As used in scientific writing in the sense of principally, chiefly, mainly, virtually, in effect, most of, and almost, essentially is a poor choice. "Most of the formation is limestone" is preferable to "The formation is essentially limestone".

Extend

Consider the merits of give, accord or offer when expressing thanks to your associates.

Facilitate

"The field officer was facilitated in his work by the manager of the Hudson's Bay Company store". Wrong. The work may have been facilitated but not the officer.

Fact

The tendency to use such meaningless phrases as as a matter of fact, in fact, the fact is, actually, may reflect a sense of insecurity in the writer. He attempts to assure his reader that he is dealing with facts and actualities not theories and surmises.

Factor

A factor is something that contributes to an effect but too commonly it is made to serve inappropriately for such words as circumstance, component, consideration, constituent, element, event, fact.

Farther

Use farther when implying distance; but use further when implying something additional, as 'with further regard to...'.

For and of

John Smith is manager for a company and of a mine.

Frequently – see occasionally

Generally speaking

Avoid the expression generally speaking in such sentences as: 'Generally speaking, the rocks are well exposed'. No one is speaking – not even the rocks.

Hanging participle

Care should be taken to avoid the 'hanging' participle, gerundial, or infinitive phrase, that is, one for which the subject is missing. Amusing illustrations have been quoted as: (a) Having eaten our lunch, the boat sailed for Quebec; or (b) When three years old (or, at the age of three), my grandmother died. However, these are no more absurd than the following: (a) 'Approaching the contact, the phenocrysts decrease in size'; (b) 'On crossing the ridge, the quartz veins appeared at closer intervals'; or (c) 'Reviewing the preceding paragraphs, the Cache Creek Group...'.

Horizon

A horizon, is, theoretically, a plane, and the word should not be used in reference to features that have implied or measured thicknesses. Alternative words are zone, band, belt, bed, seam, parting, etc. Thus we have platy zones, fossil zones, mineral belts, ironstone bands, concretionary bands, sandstone beds, seams of coal, and partings of shale, bentonite, etc.

i.e. and e.g.

The first stands for id est (that is) and introduces a definition; the second stands for exempli gratia (for the sake of example) and introduces an illustration.

Imply and infer

Do not confuse these words. 'What do you imply by that remark?' 'What am I to infer from that remark?'

Include and comprise

The verb include implies only part of a whole; the verb comprise implies all. For example, a section may include fossiliferous limestone, but it comprises this limestone as well as other rocks.

Infinitive phrase – see hanging participle

Intrusives

The words intrusives, pyroclastics, clastics, and accessories are not nouns, and when used in that sense are geological lingo. Preferably they should be used only in the adjectival sense; use intrusions or intrusive rocks, accessory minerals, etc.

-ize, -ise, verbal endings

Most verbs ending with sound iz derive from the Greek izo and hence the current North American usage, ize, is the more correct, e.g. analyze. There are some verbs however that do not trace their lineage to a Greek source and these should be spelled with ise. Some examples are advertise, advise, apprise, comprise, despise, enterprise, exercise, improvise, incise, revise, surprise, surmise, televise.

Isotopic nomenclature

^{14}C; $^{40}Ar/^{40}K$

Lithologic names used in the plural form

To write "The gneisses, schists and iron formations of the area..." is geological jargon comparable to "mineralization" "clastics" "accessories" etc. and should be avoided. Gneiss, schist and iron formation are collective nouns that need not be pluralized. "The iron formations of the area..." can be rewritten "The iron formation units...".

Locate

Locate is commonly misused, as in the expressions: the Company located the mill; he was located at Toronto; or he located the ore shoot. Use other words, such as place, situate, reside, find, etc. A millsite may be located (established in a certain position), but the mill is built at a certain place. You may locate a claim, but you find the ore on it. In many instances, too, the word may be omitted to advantage, as in the sentence: 'The millsite is on (not located on) Spring Creek'.

Major and majority

These words should be restricted to senses that involve numbers and should not be carelessly substituted for the greater part of a whole that is not numerical.

Map area

Do not confuse a map or sheet with a map area. You set up camp, run traverses, and examine the geology in a map area or area, not in a map, map sheet, or sheet, which is a piece of paper.

More or less

More or less is an expression that is much overworked. 'The beds are more or less vertical' or 'The situation is more or less unique'. These are poor sentences. Nothing can be more than vertical or more than unique. Almost, approximately, virtually, are more appropriate.

More than and over – see over

Near by

Near by is an adverb, nearby an adjective.

Non-

A useful negative prefix but do not use it in preference to more colourful antonyms. Thus unessential is usually a better word than nonessential and dissent is to be preferred to nonconcurrence.

A number of

Too inexact. Be more specific or give the correct number.

Observed – see encountered

Occasionally

Occasionally, frequently, and often imply time, as 'I go there occasionally'. They are commonly misused for the words in places, in many places, here and there, rarely, and commonly, with reference to place. You may hear wolves frequently (not commonly) but see them rarely (not occasionally).

Often – see occasionally

Occur

Occur is overdone by many writers. Commonly it can be substituted for by some other word or words giving a more precise meaning as: find, happen, exist, follow, be present, be, live, stand, ensue, take place, etc.

One

Do not use one as a first-person pronoun. 'One must complete the program although I know that the season is late.' Its use as an impersonal pronoun is acceptable.

Orient and Orientate

Both forms of this verb are acceptable and both give rise to the same noun orientation.

Over and more than

Do not use over for more than; you can go over the top, but can't walk more than 5 miles in an hour. A gully is not over 200 feet deep but is more than 200 feet deep.

Overall

Overall is overused. Select one of many synonyms that are more exact: absolute, aggregate, average, complete, comprehensive, general, inclusive, net, overriding, supreme, total, whole.

Owing to

Owing to is commonly followed by the fact that, a wordy phrase for which the conjunctions because, for, or as might better be substituted (see also due to).

Partially and partly

Partially is commonly misused for partly, as in the sentences: 'The area is partially drift covered'; 'the orebin is partially filled'; or 'the granodiorite is partially altered'; etc. Partially implies partiality, and should never be used without first considering the claims of partly.

Particular

Do not misuse this strong adjective. Use it for emphasis. The noun to which it is attached should be one that you wish to single out.

Plateau

Although plateaux and plateaus are acceptable plurals for this and similar words, the latter is preferable.

Portion

Portion is commonly misused for part, as in 'the northern portion of the area'. Portion refers to share as in 'your portion of the profits'.

Practically

Do not use this word as a substitute for almost or nearly. It is absurd to write that a political candidate practically won when actually he lost.

Prefixes pre and post

The prefixes pre and post are used with time verbs or their derivative nouns to mean "before (or after) in time, previous (later)". When these prefixes are affixed to nouns of adjectives they mean "before (or after), front (hind), anterior (posterior)". Thus it is correct to say:

pre-August sale
postoperative
postdepositional
pre-Fraser Valley Glaciation

Geologic time terms may be used with these prefixes, as, pre-Jurassic, Precambrian, post-Tertiary, and post-Mississippian.

Program and programme

Program, the preferred spelling, was the common form even in Britain until the nineteenth century.

Pyroclastics — see intrusives

Quantity

Avoid such expressions as the majority of, a good deal of, a lot of, and a number of, where the words most or much will serve for the first three expressions, and one or other of a few, several, many, or numerous will convey a more definite meaning for the last.

Quite

The word quite means absolute, to the fullest extent, or without limitation. It is commonly misused to qualify rather than, properly to establish a condition or quality, as in the statement: 'the pebbles are quite round', meaning nearly round. Pebbles that are 'quite round' should be absolutely spherical.

Range

The word range implies a minimum as well as a maximum limit; it is incorrect to say 'the beds range up to 10 feet thick'.

Redundant words

Many reports are littered with the expressions, there is, there are, there were, etc., implying, in most instances, either careless writing or loose thinking. Generally such words can be avoided and the sentences rewritten in more compact form, as: 'In most specimens there is more biotite than hornblende', which can be rewritten to advantage as: 'Most specimens contain more biotite than hornblende'; or 'there are fourteen veins exposed on this property' (Fourteen veins are exposed on this property). Use sparingly such verb forms as: meet with, dealt in, operated on, reported on, make up, divide up, split up, empty out, start up, climb up, close down, flow down, cave in, etc. Not uncommonly the extra word is redundant, or such compound expressions can be replaced by single words, as:

in those areas where — where
carry out — perform
look after — watch
fall off — decline
prove up — test
dies out — ends

The following are other examples of unnecessary words:

Square in shape.
He walked for a distance of 10 miles.
At the present time.
Few in number.
Exposed at the surface; or surface outcrops.
Mining is carried on extensively throughout the area.
In the vicinity of for near.
Covered over for covered.
Pyrite, chalcopyrite, and also free gold.
The rock is dark green in colour.
The conditions were favourable for landslides to occur.
An innumerable number of tiny veins.
Contemporaneous in age.
So far as is known.
A rough estimate of the approximate position.
Change: 'good lighting conditions were absent on many flights' to 'light conditions were poor on many flights', and 'bedded to completely unbedded' to 'bedded to massive'.

The following sentence will illustrate the use of unnecessary words (underlined), and the advantage gained by their elimination; the words in parentheses are added to complete the sentence; 'All of the wells in this township are in the glacial drift and the majority (most) of them are less than 30 feet (deep) with only a few deeper ones'.

Sediments

The term sediments may be used in the place of sedimentary rocks where more convenient.

Sharp

Sharp, not sharply is the right adverb to use in matters of time and direction. 'Turn sharp right at the station'. 'Meet me at eight o'clock sharp'.

So far as – see as far as

Somewhat

If a mineral is somewhat altered, it is altered, and somewhat is unnecessary; if some attempt is being made to indicate the degree of alteration, use more specific terms, such as slightly, partly, largely or completely. In the same class with this word are several others – perhaps, about, considerable, probably, and rather, as: 'the quartz is rather hard, and walls are very straight'; the lode is probably about 10 feet wide'; and 'the value of the gold produced was considerable'.

Tends to

Tends to – is incorrectly used in such expressions as: 'The vein tends to split...' or 'The fault tends to swing to the north'. Either the vein splits, or it doesn't; and, similarly, either the fault swings or it maintains its course. The expression is used correctly in the sentence: 'Dispositions tend to change with age.'

Terminations

Use the terminations -ic and -ical in a phonetic sense, except where custom may have dictated otherwise: e.g., avoid geologic but prefer topographic, except for Topographical Survey. Generally words ending in "-spheric" will take no "-al" (hemispheric, atmospheric) but "spherical". Words ending in "graphic" will take no "-al" (topographic, geographic, petrographic). Words ending in "-logic" will take an "-al" (biological, geological, petrological). A "rule of thumb" for other words is the closeness of the relationship with the noun: An electric light is electric but an electrical contractor is not.

Distinguish between pairs of words like historic, historical, politic, political, economic, economical.

The

The article the is generally unnecessary as applied to name seams, valleys, or other topographic or physiographic features, as: (the) Mackenzie River, (the) Fraser River valley, (the) Porcupine Creek, etc., though the ruling is not empirical and, in some instances, custom prefers its retention, as the Rocky Mountains, the Coast Range, the Great Lakes, the Great Plains, etc. On the other hand, use the in such expressions as the Mackenzie, the Liard River bridge, and the Bearpaw Formation.

Thick or thickness

The expression 'the beds are 2 to 3 feet thick' is preferable to 'the beds are 2 to 3 feet in thickness', but no choice is allowed in the expression 'the beds vary in thickness from 2 to 3 feet'.

Time comparisons

The terms earlier and older (also later and younger) are commonly misused in geological maps and reports. Earlier is a time term, as in 'Late Cretaceous or earlier'; older refers to rocks and rock formations, as in 'Blackstone Formation or older'.

Time terms

While, when, since, never, and often are essentially time terms, and should, properly, be replaced by although, where, because, as, nowhere, commonly, etc., in such sentences as: 'While others may disagree, I am prepared to defend this usage'; 'When the fault swings to the west', etc.; or 'Since the shaft is caved, no examination can be made'. They are correctly used in: 'While I am away, you...'; 'When the first assays were run...'; or 'Since the first World War, prices...'.

Titles

Titles, such as Dr., Mr., etc., should be used sparingly and if doubt arises are better omitted. Authors must be careful that names, initials and titles of persons, companies or organizations are cited correctly.

Upon and on

Most authorities agree that these words are interchangeable and the choice of one or the other depends on rhythm, emphasis, or convention.

Utilize and use

There is little difference in meaning between these words. Utilize tends to convey the meaning that good use was made of something not originally designed for the purpose and possibly under trying conditions. '...and for a bathtub they utilized an old 45-gallon drum'.

Very

Nine times out of ten the word very can be omitted without loss, and not uncommonly its use defeats its purpose, as: 'This machine makes a very perfect separation of the ore minerals from the gangue'. Nothing could be better than a perfect separation; the word very here implies 'nearly perfect'. As another example, the written statement that 'this is a very good report', is meaningless, for, depending upon how it is spoken, the report may be exceptionally good, or of normal expectancy, or distinctly disappointing to the reader. Other examples are: 'The water-bearing beds are not very widespread' (meaning of limited extent); 'The shale is very impervious'; and the expression 'very approximately' (meaning roughly).

Voice

A change of voice, from active to passive or vice versa, should not occur in a sentence, and preferably not in a paragraph. For example, the sentence: 'The writer spent last season in the area, and it is expected that he will return next year' should read: 'The writer spent last season in the area, and expects to return next year'. It will be observed that the corrected sentence also avoids a circumlocution.

Volcanics, metamorphics, clastics and similar words are acceptable in geological writing.

Which and that

Much confusion seems to arise over the correct use of the relative pronouns which and that, and literature, in general, is plagued with ill-sounding 'whiches' that could so readily and properly have been replaced by phonetic 'thats'. The rule seems simple enough: use which when introducing a new fact about the antecedent; use that when introducing something without which the antecedent is incomplete or undefined. For example: 'The process, which is of recent invention, extracts both the gold and the silver'; 'This is the house that Jack built'. It is well to note that the second sentence could be modified to read: 'The house, which Jack built, was destroyed by fire'; but in this sentence the emphasis would be transferred from 'Jack' to the destruction of the house, and the fact that Jack had built it could be omitted without loss in the sentence structure. Consider the difference in meaning between: 'The houses that are made of brick are ugly', and 'the houses, which are made of brick, are ugly'. The effective use of the comma, in separating clauses commencing with which, leaves little doubt as to the meaning intended.

With

With is much misused, especially for "and" as in the examples below:

The vein has northeast strike and (not with) a vertical dip.
The rocks have been indurated, titled, and slightly folded.
not The rocks have been indurated and tilted, with some slight folding.

With is used in the sense of "but" and a verb in the following sentences:

The rocks are mostly grey slate but include some greywacke.
not The rocks are mostly grey slate with some greywacke.

The water is very clear but has a faint bluish tinge.
not The water is very clear with a faint bluish tinge.

The surface of the bedrock is fairly even but contains depressions representing temporary channels of the shifting creek.
not The surface of the bedrock is fairly even with depressions representing...

With is sometimes used in place of a verb, as in the example:

The rock is even grained, finely laminated, and well bedded and exhibits clearly defined jointing.
not The rock is even grained, finely laminated, and well bedded with clearly defined jointing.

Appropriate Prepositions with Nouns, Verbs, Adjectives and Adverbs

Idiom calls for certain nouns, verbs, adjectives and adverbs to be followed by particular prepositions. Some of the more common appear below:

Abound in (a man abounding in natural ability)
Abound with (a faithful man shall abound with blessings)
Accord with (of one's own accord)
Account for
Acquiesce in
Adhere to
Adverse to
Agree on terms
Agree to a proposal
Agree with a person
Aim at
Alien to
Averse to (preferred to *from*)
Aware of
Begin by doing something
Begin from a point
Begin with an act
Benefits of the benefactor
Benefits to the beneficiary
Capable of
Capacity for
Circumstances (in the)
Compare with (to note points of resemblance and difference)
Compare to (only when used in the sense *to liken to*)
Concur in an opinion
Concur with a person
Conditions (under the)
Conform to (adapt one's self to)
Conform with (in harmony with)
Consist in (Definition: Memory consists in a present imagination of past incidents.)
Consist of (Material: The meal consisted of fish.)
Consistent with
Content one's self with
Content others by
Contrast (When contrast is used as a verb, it is followed by *with*. Either *to* or *with* may be used when the word *contrast* is used as a noun.)
Conversant with
Correspond to (resemble)
Correspond with (communicate)
Demand for a thing
Demand a thing from or of a person
Derive from
Differ, -ent, from (preferred to *than, to*)
Differ with a person in opinion
Disagree with a person
Embark in a business
Embark on a ship
Endowed with
Find a fault in a person or thing
Find fault with a person
Forbid (one) to do
Free from
Indifferent to
Infected with disease, bad qualities
Infested with insects, wolves, vermin
Initiative in (to take) (on one's own initiative)
Insensible to
Insight into
Invest in a business
Invest with an office, a garment
Join in a game
Join with some person or thing
Labour at a task
Labour for a person, for an end
Labour in a good cause
Labour under a disadvantage
Live by labour
Live for riches
Live on an income
Look after a business
Look at a thing
Look for a missing article
Look into a matter
Look over an account
Moment (on the spur of the)
Moment's notice (at a)
Oblivious of or to
Parallel with or to
Perpendicular to
Point at a thing
Point to a fact
Possessed of wealth
Possessed with an idea
Prefer one to the other
Prefer to do one thing rather than another
Preference for
Prevent from doing something
Proceed against a person
Proceed to an act not previously started
Proceed with an act already started
Prohibit from doing something
Provide against ill luck
Provide for an emergency
Provide one's self with something
Pursuant to (in pursuance of)
Ready for a journey
Ready to do something
Ready with a reply
Reckon with a person, a contingency
Reference to (preceded by *with* not *in*)
Regard for a person (with regard to a subject)
Regard for one's own interest
Relief to suffering (to bring)
Relieve one from a duty
Relieve with a tint
Responsibility of deciding, of a position
Responsibility to a person for an action
Result from an event
Result in a failure
Result of an investigation
Right of doing
Right to do
Satisfaction in an improvement
Satisfied of a fact
Satisfied with a thing
Secure against attack
Secure from harm
Secure in a position
Tamper with
Tinker at
Unconscious of
Variance on certain topics (at)
Variance with a person (at)
Versed in
View of circumstances (in)
View to a purpose (with a)
Wary of a danger

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