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A GUIDE TO RESEARCH IN THE HISTORY OF BLACKSMITHING

BY
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The work practices of traditional artisans have been receiving increasing attention from researchers in recent years. Attracted to an age which they feel was simpler and more human, students have begun the task of reconstructing the historical world of hand-tool work. The research, however, involves methods and sources not always obvious to the beginner. In this essay, the intention is to deal with the possibilities and pitfalls of research in the history of blacksmithing. More specifically, the focus is on the general smith who tended to live in rural areas, rather than on specialists, such as locksmiths and cutlers, who were more likely to flourish in an urban setting, or industrial smiths who worked in a large manufactory. The center of attention is on the smith's tools, techniques, and products; that is, on the material culture and technology rather than on the economy and the community in which the smith worked, though many of the sources in question provide information on these subjects as well. No attempt is made here to be exhaustive. The guide is intended mainly as a primer incorporating the particular insights of historians and archaeologists. It is also limited largely to sources in the English language.

It is useful for the student of blacksmithing to begin by situating it within the larger context of iron and steel technology. Smithing was only one branch of the industry which included the smelting of metals from ore and their shaping by forging or casting. The smith forged or shaped wrought iron and many grades of steel by heating and hammering when the metal was soft, but still in the solid state. This was not possible with cast iron which had a higher carbon content and which tended to fracture if worked in this way. Instead, it could be shaped only by heating to a molten state and by casting in moulds. Further information on the development of the technology can be found in Charles Singer, et al (eds.) A History of Technology, 5 Vols. (Oxford: Clarendon Press, 1956). A brief introduction from a Canadian point of view is: Eric Arthur and Thomas Ritchie, Iron: Cast and Wrought in Canada from the Seventeenth Century to the Present, (Toronto: University of Toronto Press, 1982).

For an introduction to blacksmithing, the student may consult any of several modern sources. Some of the recently published studies, which will also be mentioned in other contexts, are useful. Examples are: Alex W. Bealer, The Art of Blacksmithing, revised, (New York: Funk and Wagnalls, 1976); H.R. Bradley Smith,

Blacksmiths' and Farriers' Tools at Shelburne Museum, (Museum Pamphlet Series No. 7, Shelburne, Vt.: Shelburne Museum Inc., 1966). Smithing, however, is a three dimensional process not easily described in literature. It is more useful to visit any of the heritage sites in operation in Canada or the United States in order to observe actual smiths at work. The Restored Village Directory, (5th ed., New York: Quadrant Press Inc., 1978), provides an introductory inventory of these sites. The Official Directory of Canadian Museums and related institutions, (Ottawa: Canadian Museums Association, 1984-85), has a more complete list of Canadian sites. Some of the visual depth and motion of smithing is also captured in a number of films depicting traditional work techniques. Two examples available from the colonial Williamsburg Foundation are "Gunsmith of Williamsburg" and "Hammerman in Williamsburg".[1]

These modern sources do not contain direct evidence of particular historical periods. Surviving artifacts and the remains of earlier shops provide information of this kind. Pictures provide a less tactile, but still informative, connection with material history. Smiths rarely left records of their techniques. Survivors, however, can sometimes be persuaded to reveal some of the secrets of the craft. Account books and correspondence also exist which throw light on the historical world of blacksmithing. Finally, information on working methods in earlier periods is available in published texts of the time.

Encyclopediae, Mechanical Dictionaries, Blacksmithing Manuals, and Journals

These publications probably contain the best written evidence on past technique. First appearing in the 17th century, they reflected a growing belief in the importance of the trades as engines of material development and human progress. The number of texts increased in the 18th, and again in the 19th century, as the pace of mechanical change quickened and the traditional apprenticeship system of education collapsed. In the 20th century, the general mechanical dictionaries have become less numerous as technology has become more exclusively the preserve of the professional. At the same time, blacksmithing manuals have become more prevalent as craftsmen struggled to keep alive the time-honoured methods of the trade.

The following lists are divided between general works on the mechanical arts and specialized works on blacksmithing. Note that separate lists for the various blacksmithing specialities have not been included. The material on skills such as cutlery, farriery, gun and locksmithing, watchmaking, wheelwrighting, and coopering, is simply too extensive to be included here. The lists are purely introductory. They represent the most useful references discovered by the authors in the course of their respective researches, which have been principally on blacksmithing in 19th century Ontario. The lists are chronological. Beware of reading backward or forward; that is, of assuming that the techniques described in one period might be typical of another. The student also should consider to what extent the evidence in particular publications reflected the habits of working smiths in that period. Monolithic descriptions of techniques do not reflect the variations in technique and style common among individual smiths. Moreover, there was a tendency in these publications to glorify the innovator and chronicle the unusual rather than the typical. Thus, these accounts need to be evaluated carefully in the light of what other evidence is available.

Encyclopediae and Mechanical Dictionaries

The works in this sub-section vary in size and scope. Encyclopediae are comprehensive reference works, often issued in many volumes, containing information on a wide range of subjects. Mechanical Dictionaries tend to give shorter summaries of information on a more restricted list of topics relating to mechanics. Handbooks are still more specialized, for example dealing specifically with metals.

1703
Joseph Moxon. Mechanick Exercises or the Doctrine of Handy-works. London: Dan Midwinter and Tho Leigh, 1703. (Fig. 1)

1819
Abraham Rees. The Cyclopaedia; or, Universal Dictionary of Arts, Sciences and Literature. 5 Vols. London: Longmans.

1824
Peter Nicholson. The Mechanic's Companion, or, the Elements and Practice of Carpentry, Joinery, Bricklaying, Masonry, Slating, Plastering, Painting, Smithing, and Turning... London: J. Taylor.

1831-34
John Holland. A Treatise on the Progressive Improvement and Present State of the Manufactures in Metal. 3 Vols. London: Longman, Rees, Orme, Brown and Green.

1850-51
Appleton's Dictionary of Machines, Mechanics, Engine-Work, and Engineering. 2 Vols. New York: D. Appleton & Company.

1851
Oliver Byrne (ed.) The Practical Metal-Worker's Assistant. Philadelphia: H.C. Baird; Chicago: J.A. Norton.

1853
Andrew Ure. A Dictionary of Arts, Manufactures, and Mines:... Fourth Edition. 2 Vols. Boston: Little, Brown.

1854
Charles Tomlinson (ed.). Cyclopaedia of Useful Arts, Mechanical and Chemical, Manufactures, Mining and Engineering... 2 Vols. London: G. Virtue.

1872-76
Edward Knight. Knight's American Mechanical Dictionary ... Tools, Instruments, Machines, Processes and Engineering. 3 Vols. orig. pub. New York, Vols. 1&2, 1872. Vol. 3, 1876. reprinted St. Louis MWTCA & EAIA, 1979.

1880
Park Benjamin (ed.). Appleton's Cyclopaedia of Applied Mechanics: A Dictionary of Mechanical Engineering and the Mechanical Arts. 2 Vols. and supplement. New York: D. Appleton & Company.

1884
Edward H. Knight. Knight's New Mechanical Dictionary. A Description of Tools, Instruments, Machines, Processes, and Engineering, with Indexical References to Technical Journals (1876-1880). Boston: Houghton, Mifflin & Co.

For further listings, see: Eugene S. Ferguson , Bibliography of the History of Technology, (Cambridge, Mass.: The Society for the History of Technology and the M.I.T. Press, 1968, pp. 56-57, 61-67). Ferguson also discusses other kinds of sources useful to students of blacksmithing including government records, manuscripts, illustrations, travel descriptions, periodical literature, technical societies and exhibitions. He lists no works specifically on blacksmithing, but he does have references to works on metals, pp. 256-262, and to studies on hand and machine tools, pp. 276-280. Because of its publication date, this work does not include the most recent material.

Blacksmithing Manuals and Journals

With the passage of time, publications became more detailed and specialized. Manuals and periodicals focusing on blacksmithing began to appear in the late 19th century, with studies of sub-specialties such as horseshoeing following soon after. An introduction to manuals may be found in; United States, Library of Congress, Division of Bibliographies, Elementary Books on Blacksmithing and Forging, (Washington, D.C.: 1940). Although this is a small pamphlet containing only 6 books, the annotations are good and it is intended as an aid to students. Journals of the trade included the Blacksmith and Wheelwright, 1880-1932; Blacksmith's Journal, 1900-1929; and in Canada, the Canadian Blacksmith, 1910-1944. Others may be found in finding aids such as Edna Brown Titus, ed., Union List of Serials in Libraries of the United States and Canada, (third edition, 5 vols., New York: H.W. Wilson, 1965), and in the Union List of Scientific Serials in Canadian Libraries, (eighth edition, Ottawa: National Research Council of Canada, 1979).

1889-91
M.T. Richardson (ed.). Practical Blacksmithing. 4 Vols. New York: M.T. Richardson, Publisher.
Based on articles in the Blacksmith and Wheelwright, this is the work by which others have come to be measured. Since it was intended for the practising smith, it took for granted the reader's knowledge of basic techniques and emphasized innovations. Yet, it remains a detailed compendium of smithing methods for almost every working situation a North American smith might have encountered in the late 19th century.

1908
John Lord Bacon. Forge Practice and Heat Treatment of Steel. New York: John Wiley and Sons.
This is one of the better manuals. Bacon is also the author of several other works on smithing practice.

1912
William Lewis Ilgen. Forge Work. (Ed. by Charles F. Moore) Cincinnati: American Book Co.
A comprehensive introductory school textbook.

1916
International Correspondence Schools. Gauges, Jigs, Dies, Tempering, Heat Treatment, Blacksmithing and Forging. Scranton: I.C.S. Reference Library, Vol. 260. International Textbook Company.

1935
James M. Drew. Blacksmithing. Saint Paul: Webb Publishing Co.

1955
Council for Small Industries in Rural Areas. The Blacksmith's Craft: An Introduction to Smithing for Apprentices and Craftsmen. London: Council for Small Industries in Rural Areas.

1968
Aldren A. Watson. The Village Blacksmith. New York: Thomas Y. Crowell Co.

1969
Alex W. Bealer. The Art of Blacksmithing. New York: Funk & Wagnalls.

1973
Alexander Wygers. The Making of Tools. New York: Van Nostrand, Reinholt Co.

1976
J.E. Hawley. The Blacksmith and His Art. Phoenix: J.E. Hawley, Publisher.

1977
Jack Andrews. Edge of the Anvil: A Resource Book for the Blacksmith. Emmaus Pa.: Rodale Press.

1980
Donald Streeter. Professional Smithing: Traditional Techniques for Decorative Ironwork, Whitesmithing, Hardware, Toolmaking, and Locksmithing. New York: Charles Scribner's Sons.
The book treats smithing as art. It focuses especially on domestic and building hardware.

For further references, see: James Evans Fleming, The Blacksmith's Source Book: An Annotated Bibliography, (Carbondale and Edwardsville, Illinois: Southern Illinois University Press, 1980). This valuable publication describes the strengths and weaknesses of almost 300 books. Intended primarily for the convenience of active smiths, it also contains much of interest to the historian including manuals and texts, works on specialized types of smithing, on the historical background of the trade, and the products of the forge.

TOOLS AND HARDWARE PUBLICATIONS

These works are distinguished by their emphasis on the material culture of smithing; that is, on the objects surrounding the smith's working life: his supplies, tools and equipment, and products. The emphasis is on pictorial representation and the literature includes both items contemporary to the period in which the objects were utilized, such as trade catalogues, and later writings, often by collectors. Note that the researcher should always evaluate how representative these sources are of the smith's world. Concerning trade catalogues, for example, how widely did the hardware of particular companies circulate? Concerning later collections, did representative objects tend to survive? For catalogues, it is notable that the variety of choice appears to decline as the industry itself declines. Information on catalogues can be gained from: Lawrence B. Romaine, A Guide to American Trade Catalogues: 1744-1900, (New York: R. Bowker, 1960), which lists the catalogues alphabetically by subject. The catalogues below are listed chronologically, whereas the collector's, museologist's and other's works are listed alphabetically.

Catalogues
1816
Joseph Smith. Explanation or Key, to the Various Manufactories of Sheffield with Engravings of Each Article. Reprint of the 1816 ed., John S. Kebabian (ed.). South Burlington, Vt.: The Early American Industries Association, 1975.
A catalogue of products from the Sheffield tool industry, perhaps for the use of salesmen.

[1845]
Kenneth D. Roberts (ed.). Tools for the Trades and Crafts: An Eighteenth Century Pattern Book. R. Timmins & Sons, Birmingham. Fitzwilliam, N.H.: Ken Roberts Publishing Co., 1976.

c 1845 ed. of an 18th century pattern book which went through a series of printings. The book includes essays on the Industrial History of Birmingham and an introduction to English pattern books.

1865
Russell and Irwin Manufacturing Company. Illustrated Catalogue of American Hardware of the Russell and Irwin Manufacturing Company. An unabridged reprint of the 1865 edition and a new introduction by Lee H. Nelson EAIA. Published by the Association for Preservation Technology, 1980.
Complete line of blacksmith tools.

1876
S.D. Kimbark. Illustrated Catalogue, 1876. Chicago: Knight & Leonard, Printers.
Complete line of smithing equipment including a wide variety of choices and replacement parts. Also included are good general essays on iron, steel, wood and timber and tables of money, weights and measures throughout the world.

1887
Benny, Macpherson & Co. Metals and General Hardware, Price List, 1887. Montreal: Printed by John Lovell & Son, 1887.
Firm established in 1855. Large variety of all standard blacksmith shop equipment. No swedges, hardys, fullers, flatters, etc.

1891
Co-Operative Foundry Company. Catalogue with Price list, 1891-2. Rochester, N.Y., 1891.

1894
Winston & Co. Catalogue. Cross Street, Finsbury Pavement, London.
Anvils, bellows, and portable forges carried by company but not listed in catalogue. "Designs and prices on application" (p.i)

1895
F.W. Humphrey. Wholesale Price List of Groceries. Toronto: The Hunter, Rose Co., Ltd., Printers, 1895-96.
"F.W. Humphrey, Importer of teas and wholesale grocer, 64 Front St., Toronto." - Bellows, vises, anvils, drills, hammers, pincers, hoof parers, dies and taps, horseshoes and nails, cold chisels and other hardware.

1898
Orr & Lockett Hardware Co. Catalogue of Mechanic's Tools. Chicago, 1898.
Portable Forges (Buffalo Forge Co.), vises, light anvil/vises.

1899
F.W. Giesswen Co. Tools and Supplies for Metal Working. New York: F.W. Giesswen, 1899.

[1902]
Tower & Lyon Co. Illustrated Catalogue No. 12. Fine Tools. New York, N.D.
Business established 1865, incorporated May 28, 1902. Tower & Lyon manufactured "Hardware, fine tools, & police equipments" in Bloomfield N.J., and was the N.Y. office of the Union Hardware Co., National Vise & Tool Works, and International Glue Co. The catalogue illustrates "Snediker's patent quick acting leg vises."

1902
Sears, Roebuck & Co. Catalogue. Chicago: Sears, Roebuck & Co.
Complete line of Blacksmithing equipment.

1903
Dawson Hardware Company Limited. Catalogue No. 1 Vancouver: Clarke & Stuart, Printers, March 1903.
Limited variety of blacksmith equipment, oriented toward placer mining.

1909
Wm. Marples & Sons, Ltd. Tools For All Trades, Price List, 1909. Reprinted by the mid-west Tool Collectors Association, the Early American Industries Association and Arnold and Walker, Feb. 1979.
Marples is a Sheffield firm.

1911
Wood, Vallance & Co. Wholesale, Shelf and Heavy Hardware, Bar Iron and Steel, Cutlery, Guns, Ammunition, Fishing Tackle, Factory, Mill, Miner's and Lumbermen's Supplies. Hamilton: Wood, Valance Limited, 1911.
Offices across Canada in Hamilton, Toronto, Winnipeg, Nelson, B.C. and Vancouver. Complete line of blacksmith tools.

1912
Logan-Gregg Hardware Company. Catalogue No. 30. Pittsburg: Pittsburg Printing Company, 1912.
Firm established in 1831. Carried complete line of blacksmith tools. Little choice in style compared with Kimbark, for example.

1916
Buffalo Forge Co. Modern Equipment for Schools of Mechanical Technology. Buffalo.
Although this is a catalogue, the middle section of the book is a basic course on blacksmithing. As the information is good, this makes it valuable from two points of view. Ill.

1922
T. Eaton Co. Ltd. Spring & Summer Catalogue, 1922. Toronto: T. Eaton Co. 1922.
Complete line with little variety. Sold as kits and as individual items. In the 1929 catalogue, the variety of goods and the prominence of the display is decreased.

Other Works on Tools and Hardware

Edwin P. Anderson. Audel's Millwrights and Mechanics Guide: For Plant Maintainers, Builders, Riggers, Erectors, Operators, Construction Men, and Engineers. New York: Theo . Audel and Co., 1940.

J. Andrews and F. Celoria. "A 19th Century Leg Vise From Staffordshire, England, with a Metallographic Analysis of parts of its Screwbox" in Science and Archaeology. No. 17, George Street Press, Fancy Walk, England, 1976, pp. 21-34.

Alex W. Bealer. The Tools that Built America. New York: Barre Books, 1976.

H.R. Bradley Smith. Blacksmith's and Farrier's Tools at Shelburne Museum: A History of their Development from Forge to Factory. Op. Cit.
A standard and valuable work.

Charles Sturgeon Buck. "The Origins and Character of the Early Architecture and Practical Arts of Ontario to 1850." 3 volumes. unpublished MA Thesis, University of Western Ontario, 1930.

This study contains many illustrations of mid-19th century tools and metal work still in existence in the author's day. Thus, the thesis is an invaluable record of resources which, in many cases, have long since vanished. It is available on microfilm from London Microfilm, 790 Little Grey St., London, Ontario.

The Chronicle of the Early American Industries Association. The Chronicle frequently carries short articles on blacksmithing tools which, in the early days of the journal, were sometimes anonymous. The following is a partial list.

Miner J. Cooper, "Blacksmith's Horizontal Drill", Vol. 14, No. 1, March 1961, p. 5.
Alexander Farnham, "Shaker Blacksmith Tongs", Vol. 16, No. 1, March 1963, p. 7.
J. Didsbury, "Tool Study - Blacksmith's Hammers", Vol. 17, No. 4, Dec. 1964, pp. 46-48; cont. Vol 18, No. 1, March 1965, pp. 12-14.
"Tool Study - Blacksmith's" [Fullers and Swages], Vol. 18, No. 2, June 1965, pp. 28-30.
"Blacksmith's Cutting Tools", Vol. 18, No. 3, Sept. 1965, pp. 46-48.
"Blacksmith's Tools" [Punches, Bolsters, Drifts, and Bending and Scrolling Tools], Vol. 18, No. 4, Dec. 1965, pp. 61-62; cont. [Tongs], Vol. 19, No. 1, March 1966, pp. 14-16.
"Blacksmith's Tools, Shop Accessories", Vol. 19, No. 2, June 1966, p. 25.
"Blacksmith's Tools - 18th Century Drilling Machines", Vol 19, No. 3, Sept. 1966, pp. 43-44; cont. [Drills, Taps and Dies], Vol. 19, No. 4, Dec. 1966, pp. 60-62; cont. [Hand Vises], Vol. 20, No. 4, Dec. 1967, pp. 57, 64.
"Earlier Farrier's Tools", Vol. 19, No. 4, Dec. 1966, p. 57.
Alexander Farnham, "Unusual Blacksmith's Tools", Vol. 21, No. 3, Sept. 1968, p. 48.
Richard F.S. Starr, "Anvil", Vol. 22, No. 3, Sept. 1969, p. 34.
Robt. G. Hill, "Datable Characteristics of anvils, (with an appendix telling how they were made)", Vol. 29, No. 2, June 1976, pp. 21-24.

Vernon S. Gunnion and Carroll J. Hopf, (eds.). The Blacksmith. Artisan Within the Early Community. Exhibit Catalog. Lancaster, Penn.: Pennsylvania Historical & Museum Commission, 1972.

Charles F. Hummel. With Hammer in Hand, The Dominy Craftsmen of East Hampton, New York. Charlottesville, Va.: Published for the Henry Frances Du Pont Winterthur Museum, The University Press of Virginia, 1973.

Description of the Dominy Tool Collection, c 1760-1840.

Henry J. Kauffman. Early American Ironware: Cast and Wrought. New York: Weathervane Books, 1966.

Ch. 4 - Blacksmith

P. Marshall. Metal Working Tools and Their Uses. London: P. Marshall, 1901.

Robt. W. Miller. Pictoral Guide to Early American Tools and Implements. Iowa: Wallace-Homestead Book Co., 1980.

R.A. Salaman. "Tradesmen's Tools c. 1500-1850," in, Chas. Singer et al, A History of Technology. Vol. 3. Op. Cit.

Herbert Schiffer. Early Pennsylvania Hardware. Whitford, Pa.: Whitford Press, 1966.

Eric Sloane. A Museum of Early American Tools. New York: Funk and Wagnalls, 1964.

Albert H. Sonn. Early American Wrought Iron. New York: Scribner's Sons, 1928.

Edwin Tunis. Colonial Craftsmen and the Beginnings of American Industry. Cleveland: World Publishing, 1965.

ARCHAEOLOGICAL RESEARCH

By studying surviving worked objects and, where possible, the site at which they were found, archaeological research can facilitate greatly the task of reconstructing historical working methods. As archaeology is particularistic in nature, and as context is crucial to interpretation, the archaeologist must pay close attention to shop layout. Although it is a manual and not an archaeological work, Juan B. Ortega's, Blacksmithing Practices, (Washington, D.C.: International Cooperation Administration, 1957), discusses the practical considerations of shop layout, and so is a good primer for the field archaeologist.

The published literature regarding the excavation of blacksmith shops is not extensive. For whatever reason, archaeologists have paid little attention to the whole class of small-scale, low technology industry into which smithing falls. The most tantilizing references occur in survey reports, (eg. Thor Conway, "Point aux Pins Archaeology; Woodland and Historic Components", in Collected Archaeological Papers, Archaeological Research report 13, Ed. by David Skene Melvin. Toronto: Historical Planning and Research Branch, Ontario Ministry of Culture and Recreation, 1980), because they appear to offer fruitful areas for future research. The most frustrating references are usually salvage (rescue) reports because the archaeologist is often only weeks or days in front of the bulldozer. There are, however, exceptions. (See: Mary T. Ambrose, The Myrtle Blacksmith Shop. BaGr-23. Manuscript on file, Ministry of Transportation and Communications, and Ministry of Culture and Recreation, Government of Ontario, Toronto, 1985).

The majority of references to blacksmith shops occur in site reports written by research archaeologists. Most of these are of use only to site interpreters, for they are excavation reports which concentrate on structural remains.

Norman F. Barka. The Archaeology of Fort Lennox, Ile-Aux-Noix, Quebec, 1964 Season. Manuscript Report series No. 190, Ottawa: Parks Canada, 1977.[2]

One small section (pp. 157-163) records the results of one week's work in this operation. Additional excavation was suggested by the archaeologist, but this does not appear ever to have been done.

James V. Chism. Excavations at Lower Fort Garry, 1965-1967: A General Description of Excavations and Preliminary Discussions. Canadian Historic Sites: Occasional Papers in Archaeology and History - No. 5. Ottawa: Parks Canada, 1972.

One short section (pp. 44-51) discusses the structural remains of two blacksmith shops which occupied the site.

James V. Chism. Report Interim Relative to Reconstruction of the Blacksmith Shops at Lower Fort Garry. Manuscript Report Series, No. 11 Ottawa: Parks Canada, 1968.

Structural reconstruction of blacksmith shop 11. With the exception of the forge, no attempt has been made to reconstruct the shop interior.

Jean Carl Harrington. "Archaeological Excavations at the Webb Blacksmith & Wagon Shop (127-4), Nauvoo, Illinois, 1967-1968." Manuscript on file, Nauvoo Restoration,

Inc., Nauvoo, Ill., March 1969.
"This report is subject to all restrictions governing the use of manuscript material. Passages from it may not be reproduced without written permission from the president of Nauvoo Restoration, Inc."

Kenneth E. Kidd. The Excavation of Ste. Marie I. Toronto: University of Toronto Press, 1949.
A brief mention (pp. 59-61) of the smithy at this famous site is given.

E. Frank Korvemaker. Archaeological Excavations at the Roma Site, Brundell Point, P.E.I., 1968-1970. Manuscript Report Series No. 442. Ottawa: Parks Canada, 1980.
One section (pp. 42-59) describes the excavation of the pre-1745 smithy at Roma. It also attempts a reconstruction of the forge. Unfortunately, the building was probably a bakery and the forge an oven.

George L. Miller. "A Report on the Artifacts from the Edwin Webb Blacksmiths Shop." Manuscript on file, Nauvoo Restoration Inc. Nauvoo, Ill.
"This report is subject to all restrictions governing the use of manuscript material. Passages from it may not be reproduced without written permission from the president of Nauvoo Restoration, Inc."

Clarence F. Richie. "Jones Falls Blacksmith Shop: Preliminary Artifact Analysis", in Miscellaneous Archaeological Reports, Ontario Region, 1978-1981. Microfiche Report Series 18, Ottawa: Parks Canada, 1983.

Harley Stark. "Archaeological Research at Jones Falls Lockstation, Rideau Canal, 1978", in Miscellaneous Archaeological Reports, Ontario Region, 1978-1981. Microfiche Report Series 18, Ottawa: Parks Canada, 1983.

Mark Warrack. Historic Naval and Military Establishments, 1817-1856. Archaeological Report, 1974 (pp. 47-54) and Archaeological Report, 1978-79 (pp. 66-78). Manuscripts on file, Huronia Historical Parks, Midland, Ont.
Reports on the excavation of and artifacts from the smithy dump. The shop itself was destroyed. The artifacts are examined in an attempt to determine the activities of the smith.

The most valuable literature is that which aims at a synthesis of all the available historical and archaeological information. This usually involves an attempt to describe the technology of the smith, the type and variety of products he produced or repaired and the physical conditions under which he laboured in addition to the usual historical and structural information given in site reports.

Edward J. Lenik. "Excavations at Charlotteburg Middle Forge", in Bulletin of the Archaeological Society of New Jersey. Spring/Summer 1974.
Results of an excavation prompted by historical records of an 18th C. ironworks. The remains of four forges and two water-driven trip hammers were discovered. The basic shop layout and a brief description of artifacts is given.

John D. Light, and Henry Unglik. A Frontier, Fur Trade Blacksmith Shop, 1796-1812. Ottawa: Parks Canada, 1984.
This book is divided into three sections. Section 1: John D. Light, "Tinker, Trader, Soldier, Smith: A Frontier Fur Trade Blacksmith Shop, Fort St. Joseph, Ontario, 1796-1812", deals with the analysis of the archaeological information including shop layout, the identification of the shop owners and the analysis of artifacts. Section 2: Henry Unglik, "Metallographic Study of Early Nineteenth

Century Axes from Fort St. Joseph, Ontario", deals with the metallurgy of a class of artifact found in the smithy. Section 3: Henry Unglik, "Iron Working at an Early Nineteenth Century Blacksmith shop, Fort St. Joseph, Ontario: An Examination of Slag and Iron", describes the technical practices of the smith.

Lester A. Ross, Bryn Thomas, Charles H. Hibbs and Caroline D. Carley. Fort Vancouver Excavations - X: Southeast Fort Area. United States Department of the Interior, National Park Service, Fort Vancouver National Historic Site, 1975.

An excellent report which attempts to reconstruct the shop interior and discusses the artifacts at length.

Specific problems faced by the archaeologist who undertakes the excavation of a smithy are addressed in at least two articles.

Gerry McDonnell. "Tap Slags and Hearth Bottoms, or How to Identify Slags", in Current Archaeology, No. 86, Vol VIII, No. 3, March 1983.

A short, but valuable article.

John Stewart, John D. Light and Louis Lafleche. Identification of Work Areas in the Fort St. Joseph Smithy. Research Bulletin No. 111. Ottawa: Parks Canada, 1979.

A short article outlining two methods of finding iron working areas through soil analysis.

Finally, one article provides a methodology with which to approach the excavation of a smithy and further addresses the question of the utility of such work.

John D. Light. "The Archaeological Investigation of Blacksmith Shops", in Industrial Archeology. Vol. 10, No. 1, 1984.

ARCHIVAL RESEARCH

Written Manuscripts

The typical smith left no personal memoir, nor were his activities likely to be chronicled by others. Yet documents do exist, sometimes hidden in unlikely collections, that throw light on smithing in particular regions. A starting point for researchers in Canada is the Union List of Manuscripts in Canadian Repositories. 2 Vols. (Ottawa: Public Archives of Canada, 1975, with supplements in 1976, 1977-78, and 1979-80). This work describes many of the collections in the various archival institutions across the country. It is difficult for the student of technology to use, however, because it is arranged alphabetically by collection and by repository, rather than by industry or by occupation.

Account Books and Related Papers

While few smiths were literary men, many had the necessary skills in writing and arithmetic to keep accounts. Some of these records survive in archives and museums and still others in private hands. They reveal little directly about technology, but much about the nature and rhythm of work and about pricing and commercial arrangements with clients. For example, the information regarding Pennsylvania, Quebec and Ontario suggests that in all three areas, prior to industrialization, the typical smith was primarily involved in repair work and service for the surrounding farming community. In an era before specialization became common, his work included not only the upkeep of agricultural equipment, but also the shoeing and health care of livestock.[3] The account books from Ontario reveal the problems and possibilities of this kind of source. The Timothy Hough ledger, for instance, provides one of the earliest records of smithing services in the province. Held at Doon Pioneer Village near Kitchener, its entries begin in 1804 and show the smith working on horseshoeing, and the repair of agricultural edge tools and vehicles. The

researcher, however, must overcome phonetic spelling and barely legible notations weathered by age to make use of this source. Occasionally, account books yield special treasures. An example is the Hezekiah Hall Day Book, a copy of which is held at the Ontario Archives. Describing the transactions of a blacksmith in Gore District, Upper Canada, 1841-42, the journal also contains a home remedy for the treatment of horse ailments. The Donald Davidson Papers at the University of Western Ontario describe the activities of a smith who emigrated from Scotland in 1854. The entries include information on the costs of emigration and on his smithing activities in the new land. These papers also contain a letter from Davidson's son, who was also a blacksmith, recording the despair felt at the decline in the smithing trade in the 1870s:

> we are working at Iron Harrows for spring[.] we are not busy[.] times are very dull[.] Blacksmithing is getting Run down to nothing[.] there is large Factories getting up all over the Country by Joint-Stock Companies and run by machinery where they do nothng but Waggons and sleighs and sell them all over the Country Cheaper than we can make them[.] and Plough work is done[.] Its all the little metal Ploughs they use now[.] I only made one new sock [share] all last year... this town is so full of shops that one smith is cutting down the Prices on the other to get work.[4]

Besides the evidence of smiths themselves, several kinds of sources originate with the persons and institutions dealing with smiths. The papers and ledgers of merchants prominent in the areas served by particular smiths throw light on smithing. These collections sometimes contain lists of tools, iron and steel stock, and hardware for sale. The information may be relevant both to the supplies used by smiths and to the kinds of hardware which they were called on to repair. The papers of persons who employed smiths hold evidence on the types of work done and on the prices and wages received by the workmen. Employers included lumbermen, industrialists, and machinery manufacturers. These collections can be identified through the Union List of Manuscripts. Government departments also employed smiths. Students should peruse the collections of federal and provincial government documents held at archives in the respective capitals across the country.

Legal Documents

Documents drawn up for legal effect included deeds, assignments, apprenticeship and marriage contracts, wills and estate inventories. They provide information on the lands, shops, tools, and other possessions of smiths, as well as on the education of apprentices and the social life of persons in the trade. The papers can be found in general archival collections, in probate and notarial records, and in land registry offices – depending on the jurisdiction. Land records are usually organized geographically by lot, probate and notarial documents alphabetically by name. In some jurisdictions, such as Quebec, the evidence is extraordinarily complete, since residents were legally compelled to register a wide variety of documents with a notary.

Statistical Sources

These include tax assessment and census records in manuscript form, as well as published city directories. An introduction to the census records is found in Thomas A. Hillman, A Catalogue of Census Returns on Microfilm, 1666-1881. (Ottawa: Public Archives of Canada, 1981). Directories are listed in Dorothy E. Ryder, Checklist of Canadian Directories, 1790-1950 (Ottawa: National Library, 1979). Printed census reports that summarize the contents of the unpublished census reports are sometimes available. An introduction to the difficulties in using these reports for occupational data is found in William Wylie, "Nebulous Substance: The Portrayal of Iron and Steel Employment in the Printed Census Reports of British North America,

1851-1891," Research Bulletin No. 199. Ottawa: Parks Canada, 1983; also printed in Archivaria, XIX, 1984. Statistical sources provide information on the extent of property owned by smiths, on occupational specialization and scale of enterprise, on the degree of mechanization, and on the social background and family connections of the blacksmith. These records shift the focus from the individual to the group and permit a composite portrait of the smiths in a community or in a region.

Government and Legislative Papers, Acts, and Publications

Information on the development and organization of the trades is available in the various records of the municipal, provincial, and federal governments. A starting point for researching acts, parliamentary debates, and government reports is provided for the federal government by Olga B. Bishop, Canadian Official Publications, (Oxford and New York: Pergamon Press, 1981). Inventories are also available for the provinces both before and after Confederation. See for example Ogla B. Bishop, Publications of the Governments of Nova Scotia, Prince Edward Island, New Brunswick, 1758-1952, (Ottawa: National Library, 1957); and her Publications of the government of the Province of Canada, 1841-1867, (Ottawa: Queen's Printer, 1963). A partial list of the government records of special relevance to skilled wage-earners is in R. Hann et al., Primary Sources in Canadian Working Class History 1860-1930, (Kitchener: Dumont Press, 1973.

Newspapers

Newspaper advertisements by smiths and others in the iron and steel trade include evidence on specialization, the kinds of metal stock, tools, and hardware available, and on the labour market for apprentices and journeymen smiths. The Union List of Canadian Newspapers Held by Canadian Libraries. (Ottawa: National Library, 1977), provides information on the whereabouts of historical newspapers in Canada.

Diaries, Memoirs, Travel Accounts and Emigrant Guides

Diaries and memoirs exist in both published and manuscript form. For the latter in Canada, see the Union List of Manuscripts. Travel accounts and emigrant guides are printed descriptions of North America which were intended largely for European readers in the 18th and 19th centuries. These sources provide impressions of living conditions, the state of economic development, and occasionally, glimpses of the artisan's working conditions and techniques. For a bibliography relating to pre-Confederation Canada, see Gerald M. Craig, Early Travellers in the Canadas, (Toronto: Macmillan of Canada, 1955). This work focuses on Upper and Lower Canada, but some references refer to the rest of British North America. A list of bibliographies of travel works concerning the United States is in Eugene S. Ferguson, Bibliography of the History of Technology, pp. 129-132.

Unpublished Pictorial

While pictures reveal valuable details about smithing, good visual material is hard to find. Illustrations are rare before the introduction of photography, with the exception of engravings in encyclopedias and mechanical dictionaries. When photos began to appear after the 1840s, few were of smithing. This is partly because early photographers were more interested in portraits of families and of leisure activities than in depicting work. However, the technical difficulty of photographing in the poor light of the shop was also a hindrance. Towards the turn of the 20th century, photos of smithing became more common. The problem for the researcher is discovering them. There are literally millions of historical photographs extant, most in private hands, but increasing numbers in archival institutions. There they present a substantial organizational problem for over-worked staffs. Many photos of smithing are not catalogued or are included in listings which emphasize geographical location

or the identity of the photographer rather than the type of activity or the occupation of the person portrayed. The researcher often faces the tedious task of sifting through thousands of prints in search of a few which are relevant for his purposes.[5]

In spite of its frustrations, this research is often rewarded with handsome results. In Canada, most depictions of smithing date from the period between 1890 and 1920, when the trade began to fade from view. They contain a wealth of information concerning a limited period when the old trade was in the process of giving way to technological change and the expansion of large-scale industry. As the accompanying prints show, the information pertains to the nature of work and shop layout, to arrangements about pricing and credit, and to technological change and its impact on the smithy.

Oral History

Oral testimony, long the main source for scholars researching non-written cultures, is now becoming increasingly popular among researchers in history generally. The recollections of living persons are valuable not only for events occurring in their lifetime, but sometimes for information passed from generation to generation. In blacksmithing, oral evidence may throw light on the distinctive techniques of particular smiths, or on the lore and customs surrounding the trade. In conducting interviews and recording the results, the researcher should adopt a systematic approach. The evidence should be tape-recorded whenever possible to insure a full and accurate compilation of notes. The shortcomings of oral history should be kept in mind. Personal impressions tend to become coloured over time by changing events and personal inclinations. This is perhaps more pronounced in western societies among social groups stressing written traditions than among peoples relying primarily on oral tradition for the preservation of their heritage.[6]

ON THE HISTORY OF BLACKSMITHING IN CANADA

The history of blacksmithing in Canada is a largely uncharted territory. There is a growing body of work dealing with tradesmen as workers under industrial capitalism. For more information, see Douglas Vaisey, The Labour Companion: A Bibliography of Canadian Labour History Based on Materials Printed from 1950 to 1975, (Halifax: Committee on Canadian Labour History, 1980), and the annual bibliography in Labour/Le Travail(leur). This literature, however, deals mainly with labour organization, political action, and industrial relations rather than with the details of artisanal work processes.

Virtually ignored by academics, blacksmithing has received some attention from local enthusiasts and from museologists, but these groups have lacked the funds to be exhaustive. The result has been a few short articles and essays such as those by Barbara Shaw and Ron Merrick, The Village Blacksmith, (Halifax: Nova Scotia Museum, 1972); David E. Stephens, "Forgotten Trades of Nova Scotia," Nova Scotia Historical Quarterly, (II, No. 2, June 1972, pp. 173-189); K.A. Baird, "John Watson, Blacksmith," New Brunswick Historical Society Collections, (XVIII, 1963, pp. 64-71). A more substantial work is Sidney James Gooding's, The Canadian Gunsmiths, 1608-1900, (West Hill, Ontario: Museum Restoration Service, 1962), with a supplement published in 1974.

The exception to the pattern is the work done on blacksmithing in Quebec. A substantial body of literature has appeared there in the past decade stimulated by consciousness of a distinct cultural heritage and by a desire to record it in the face of the changing world of the late 20th century. Some researchers, alienated by the regimentation of life under industrial capitalism, have turned to the activities of the artisan who combined both hand and mental labour in a process which he controlled personally. Studies of blacksmithing have been completed by the government of Quebec, by agencies of the federal government, and by individual scholars.

The National Museum of Man has undertaken a major project on the social and cultural history of Quebec, one aspect of which has been the study of various trades. Several publications have appeared on blacksmithing. In André Bérubé, et al., Le forgeron de campagne: un inventaire d'outils, (dossier 12. Ottawa: Musée national de l'homme, Division de l'histoire, 1975), the authors use the tools of an existing shop, which has been in the same family since the early 1800s, as the starting point for a discussion of blacksmithing techniques and organization. In Le forgeron et le ferblantier, (Montreal: Les Editions du Boréal Express et les Musées Nationaux du Canada, 1978), Jean-Pierre Hardy distills the museum's research on blacksmithing and tinsmithing in Quebec for the benefit of the general reader.

In the meantime, the government of Quebec has been striving to record the existence of the surviving artisans in the province who are still working in the traditional manner. Some of this research can be found in Bernard Genest, et al., Les artisans traditionnels de l'est du Québec, (No. 12 les cahiers du patrimoine. Québec: Centre de documentation de la Direction générale du patrimoine, 1979). Another work, Bernard Genest en collaboration avec Françoise Dubé. Arthur Tremblay: forgeron de village. (Série arts et métiers. Québec: Ministère des affaires culturelles, 1978), is the product of their encounter with a particularly memorable smith. The memories of this aging man are combined with an exposition of techniques, with particular emphasis on horseshoing and wheelwrighting.

A third research thrust has come from the Quebec Regional Office of Parks Canada. Seeking to restore and interpret the iron-making community of Les Forges du Saint-Maurice, archaeologists and historians have studied all facets of technology at Les Forges including smelting, casting and forging, as well as the social and economic life of the people. Most of their reports have not been published, but all have been deposited at the National Library of Canada and at the various provincial archives across the country. One study, Serge Saint-Pierre, Les artisans du fer aux Forges du Saint-Maurice: Aspect technologique, in Manuscript Report Series 307, (Parks Canada, 1977), offers a brief exposition of smithing at Les Forges.

The most ambitious study of blacksmithing in Quebec, and indeed probably in North America, is L'artisan forgeron, (Québec: Les Presses de l'université Laval/Editeur officiel du Québec, 1979), by Jean-Claude Dupont. A folklorist and academic by profession, Dupont spent a decade researching the history of smithing in Quebec from the 17th to the 20th century. The result is an innovative study based on a rich variety of sources including written documents, illustrations, artifacts, and interviews with more than 50 surviving smiths. He deals at length not only with work techniques, but with the social and economic relations of smiths, and finally with the songs, stories, and legends making up the smith's self-image, and the perception of him held by others. Specific criticisms can be made. For instance, his typology of tools and techniques tends to fragment the traditional processes and may only confuse the general reader. But in its thoroughness of research and in its presentation of facts and themes, this is an exemplary study.

Researchers in English Canada might well take the work done on Quebec as a model for their own studies. In this regard, the emphasis on living artisans and their tools has proven a convenient introduction to the craft. Best exemplified by the work of Dupont, Quebec research has shown an ability to combine the evidence of written and pictorial sources with material and oral sources. Dupont's emphasis on the role of myth and symbol in rural Quebec also suggests new subjects of research. Even the sentiment behind these works seems worthy of emulation. Through all of them runs a belief in the achievements of the common people which contrasts with the tendency elsewhere to stress leaders and the powerful. The opportunities for the further study of blacksmithing in English Canada seem great. It is up to researchers to seize them.

ENDNOTES

1. "Gunsmith of Williamsburg", 1969, colour, 58 1/2 min., or 2 x 28 1/2 min. sound; "Hammerman in Williamsburg", 1973, colour, 37 min. sound; both available from the Colonial Williamsburg Foundation, Audio Visual Distribution Center, Box C, Williamsburg, Va. 23185.

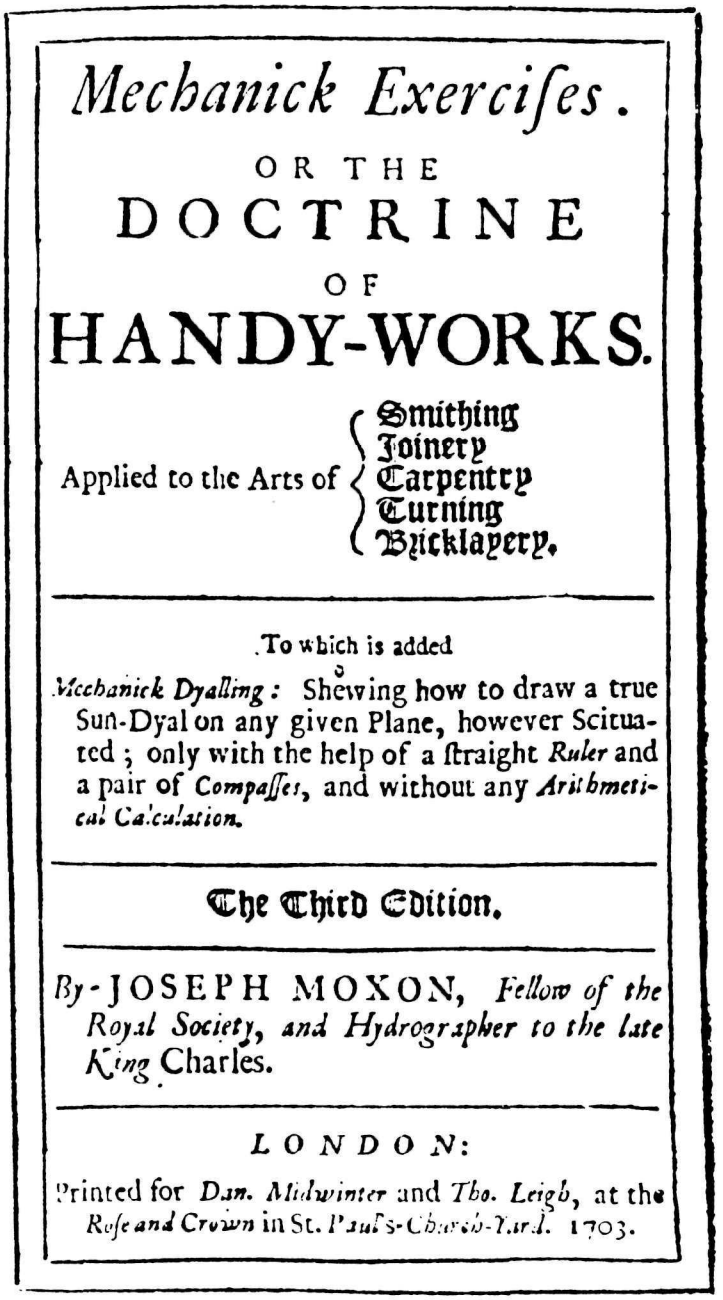
2. "The Manuscript Report Series/Travail Inédit is a reference collection of unedited, unpublished research reports reproduced in printed form in limited numbers. ... Manuscript Reports are not for sale. ... Copies of Manuscript Reports were deposited in the federal and provincial archives and in the Natural Resources Library of the U.S. Department of the Interior. Those who require specific material for research purposes should be able to obtain photocopies of reports from these depositories at prices that cover photocopying and mailing costs. Alternatively, copies may be borrowed on interlibrary loan from the Parks Canada libraries in Ottawa and in the regional offices. ... In 1982 the Manuscript Report Series was discontinued. Parks Canada's unedited, unpublished research reports are now reproduced in the Microfiche Report Series/Rapport(s) sur Microfiches." 1984 Bibliography, Manuscripts and Publications, Research Divisions, National Historic Parks and Sites Branch, Parks Canada. Ottawa: Parks Canada, 1984. pp. A-1, A-2.

3. See Jeannette Lasansky. To Draw, Upset, and Weld. The Work of the Pennsylvania Rural Blacksmith 1742-1935. Lewisburg, Pa: published by the Oral Traditions Project of the Union County Historical Society, 1980; Jean-Claude Dupont. L'artisan forgeron. Québec: Editeur officiel du Québec/Les Presses de l'Université Laval, 1979; the evidence on Ontario will be contained in William Wylie's forthcoming study of blacksmithing in Upper Canada, 1800-1850.

4. University of Western Ontario, Donald Davidson papers, Roderick [Davidson] to Donald Davidson, Strathroy Ontario, 6 February 1883.

5. For a discussion of the problems and possibilities for photographic research in Canadian repositories, see, Hilary Russell, "Reflections of an image finder: some problems and suggestions for picture researchers", Material History Bulletin/Bulletin d'histoire de la culture matérielle, (XX, fall 1984).

6. There are many publications available which describe oral history techniques in some detail. See, for example: Cullom Davis, et al. Oral History: From Tape to Type. American Library Association, 1977.



Mechanick Exerciſes.

OR THE

DOCTRINE

OF

HANDY-WORKS.

Applied to the Arts of { Smithing, Joinery, Carpentry, Turning, Bricklayery.

To which is added

Mechanick Dyalling: Shewing how to draw a true Sun-Dyal on any given Plane, however Scituated; only with the help of a ſtraight *Ruler* and a pair of *Compaſſes*, and without any *Arithmetical Calculation.*

The Third Edition.

By JOSEPH MOXON, *Fellow of the Royal Society, and Hydrographer to the late King* Charles.

LONDON:

Printed for *Dan. Midwinter* and *Tho. Leigh*, at the *Roſe and Crown* in St. *Paul's-Church-Yard.* 1703.

Fig. 1.
Title page of Joseph Moxon, Mechanick Exercises, third edition, 1703; this is the most famous early discussion of blacksmithing technique.

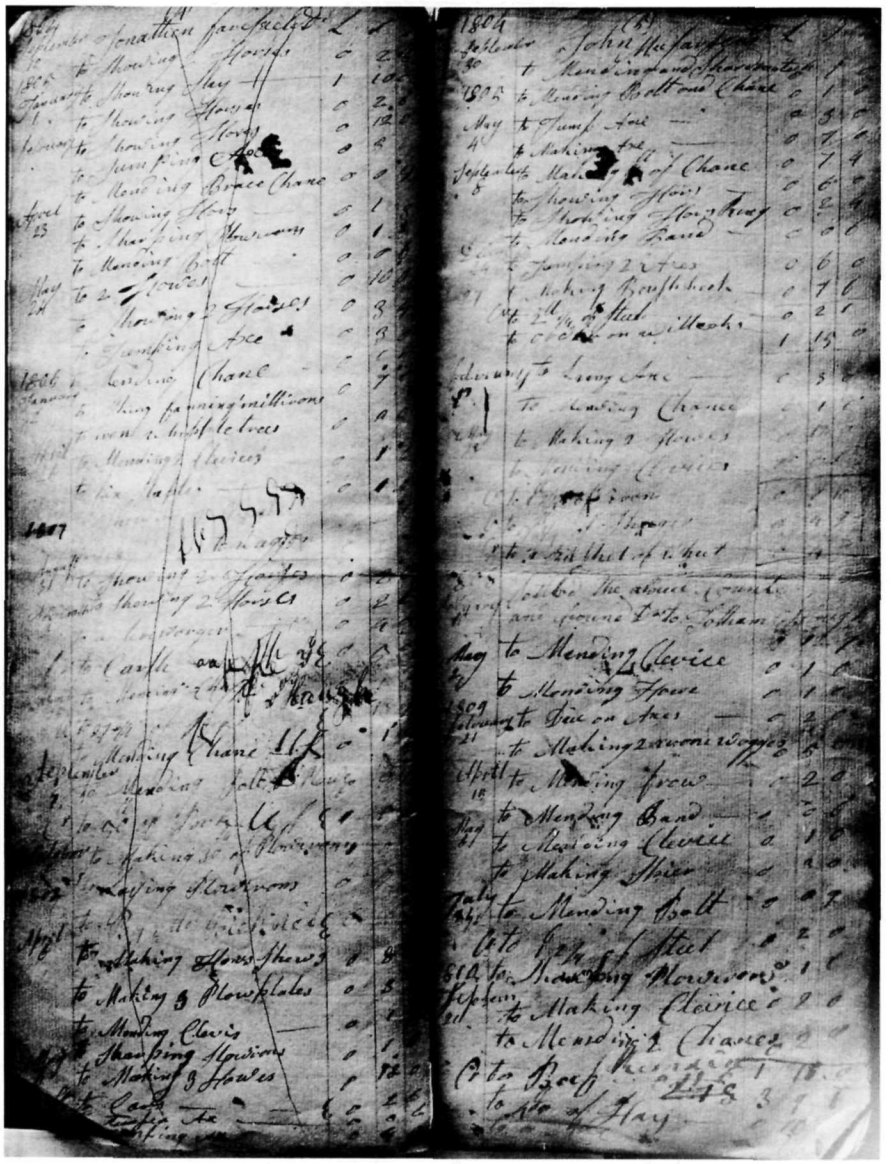


Fig. 2

This excerpt from the account books kept by Timothy Hough of Napanee in 1804-07 is now held by Doon Pioneer Village, Kitchener, Ontario. The page fragment demonstrates the difficulty the researcher sometimes has in deciphering unusual spelling and faded script.

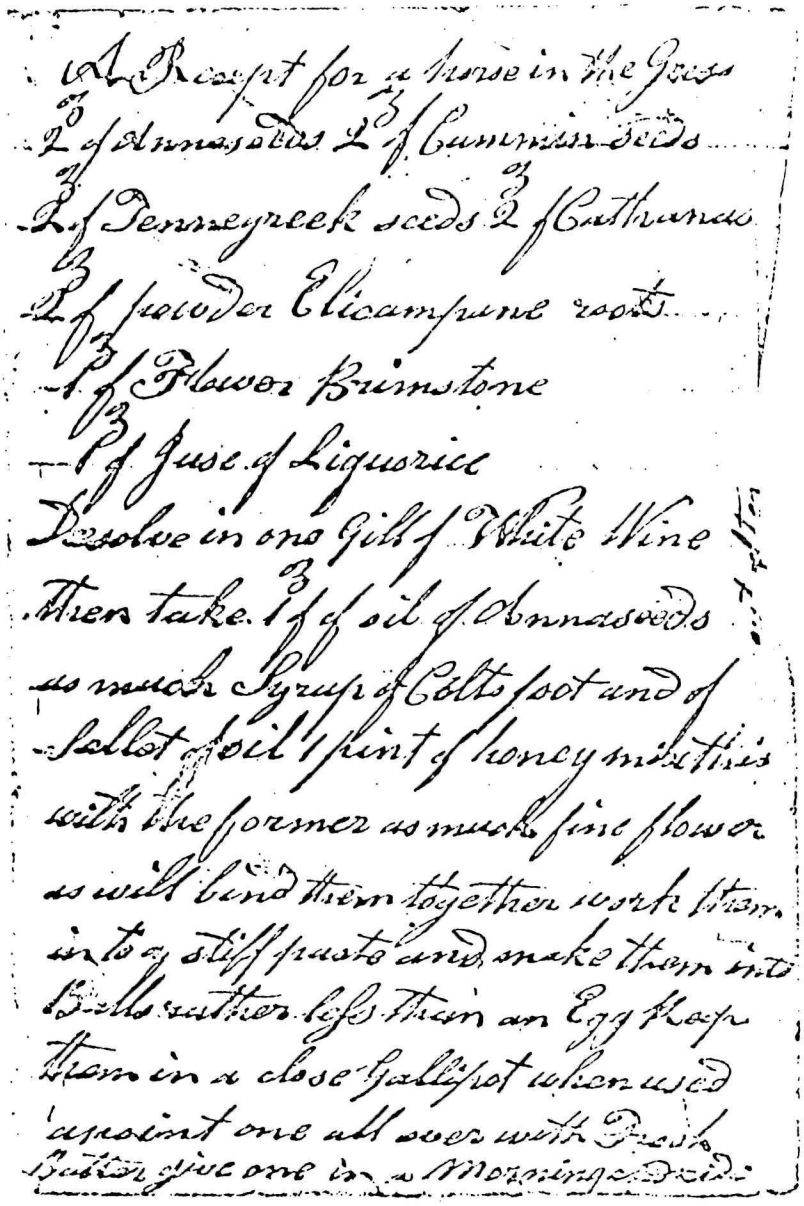

A Receipt for a horse in the Grass
℥ 2 of Annaseeds ℥ 2 of Cummin seeds
℥ 2 of Fennegreek seeds ℥ 2 of Carthamus
℥ 2 of powder Elicampane root
℥ 1 of Flower Brimstone
℥ 3 of Juse of Liquorice
Dessolve in one Gill of White Wine
then take ℥ 3 of oil of Annaseeds
as much Syrup of Colts foot and of
Sallet oil 1 pint of honey mix this
with the former as much fine flower
as will bind them together work them
into a stiff paste and make them into
balls rather less than an Egg flop
them in a close Gallipot when used
anoint one all over with Fresh
butter give one in a morning fasting

Fig. 3
Prescription for horse medicine; Ontario Archives, Miscellaneous Collection 1841, No. 17, Hezekiah Hall Day Book, Binbrook Township, Gore District, Upper Canada.

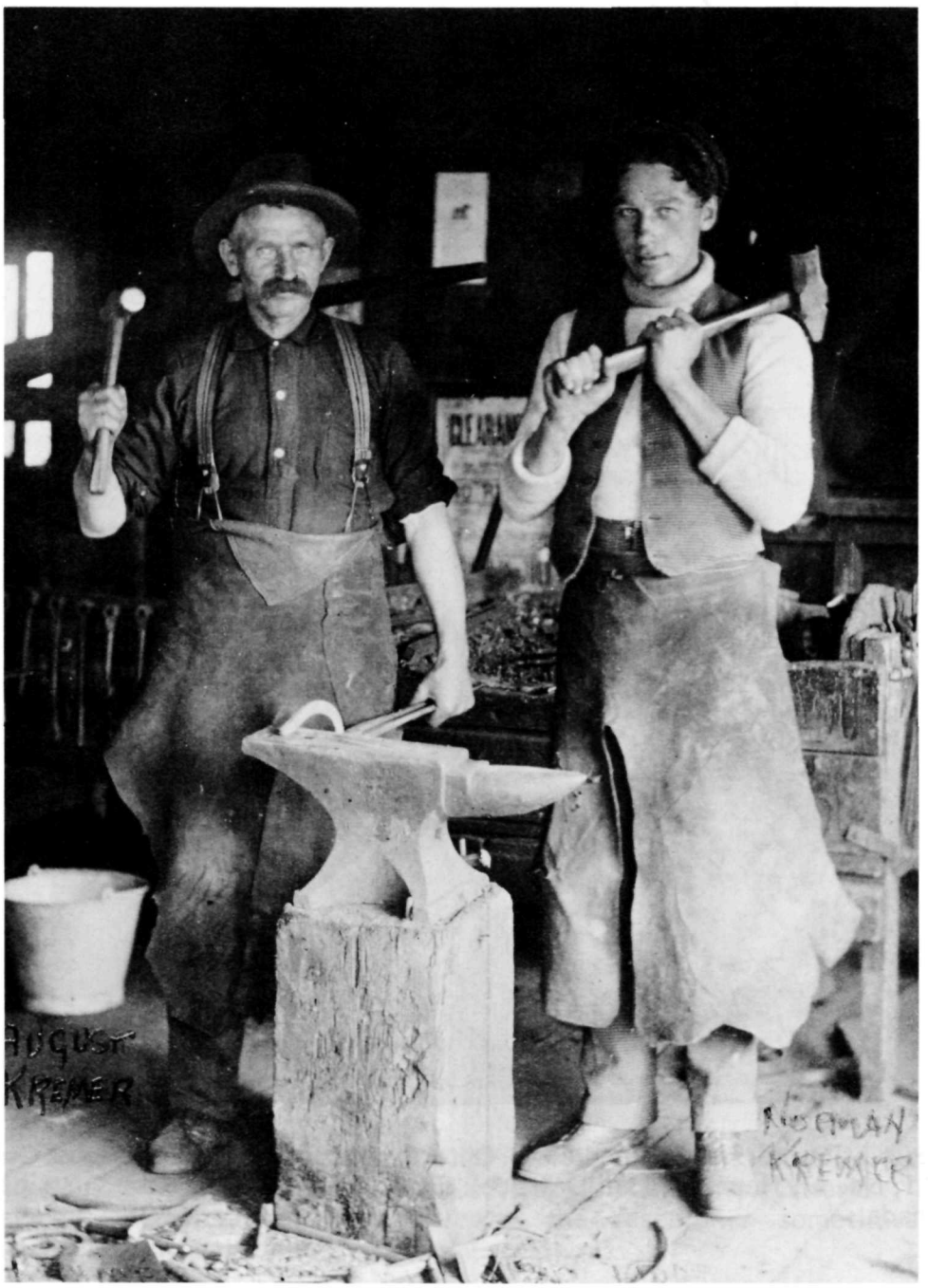


Fig. 4

Innisfail, Alberta, c. 1910. This photo contains particularly good detail on the clothes and aprons of the smith and his helper. Note the sledge in the hands of the helper (striker) to be swung at the command of the smith who indicated the area to be struck by tapping it with his hammer between each blow of the sledge. (Glenbow-Alberta Institute)

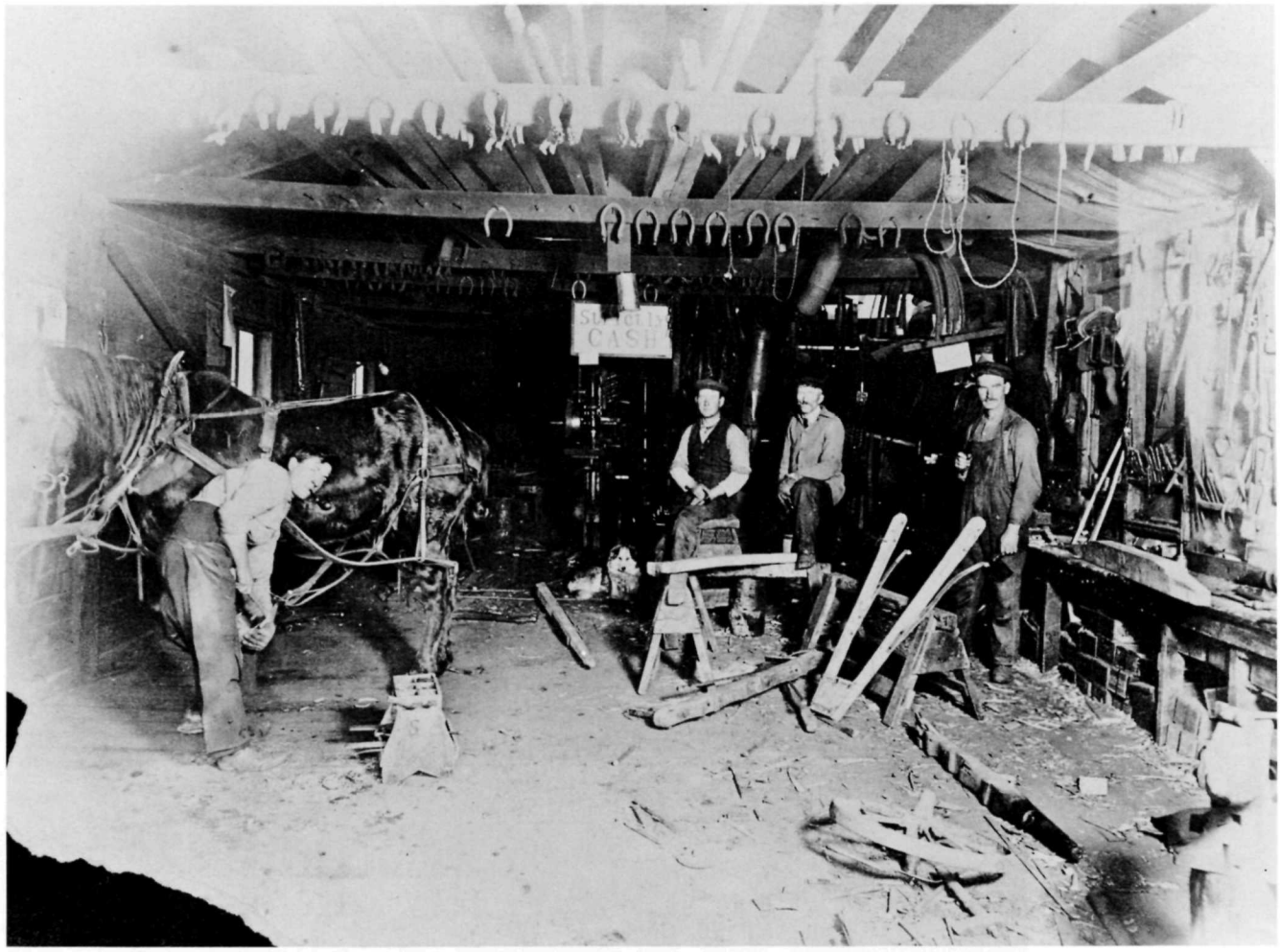


Fig. 5

Vermilion, Alberta, 1910. Smith shoeing horse: note the setup of the shop which permits him to perform this work inside with the aid of a portable tool box which rests at his feet. There is evidence in the wood shavings on the right that, in the course of repairing agricultural equipment, the smith also performed woodwork. Finally the notice "STRICTLY CASH" points to a common commercial practice in the west during this period. (Glenbow-Alberta Institute)

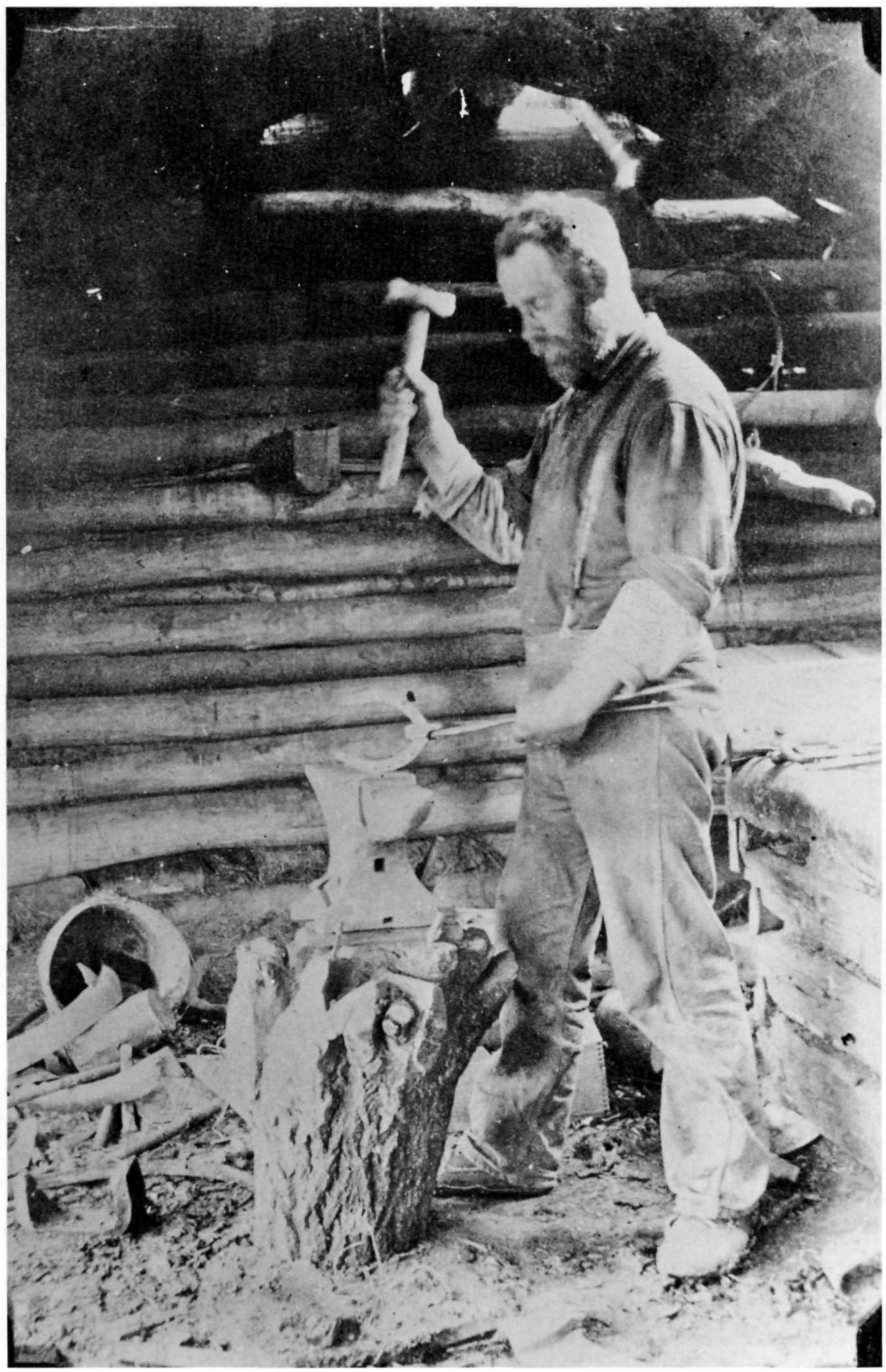


Fig. 6

Alix, Alberta, n.d. It is not uncommon for farmers to have small smithies on their farms. In this photo, Farmer Charlie C. McDermid is shown shaping a shoe for one of his horses. Note the rough conditions. Everything about this shop is strictly utilitarian. (Glenbow-Alberta Institute)

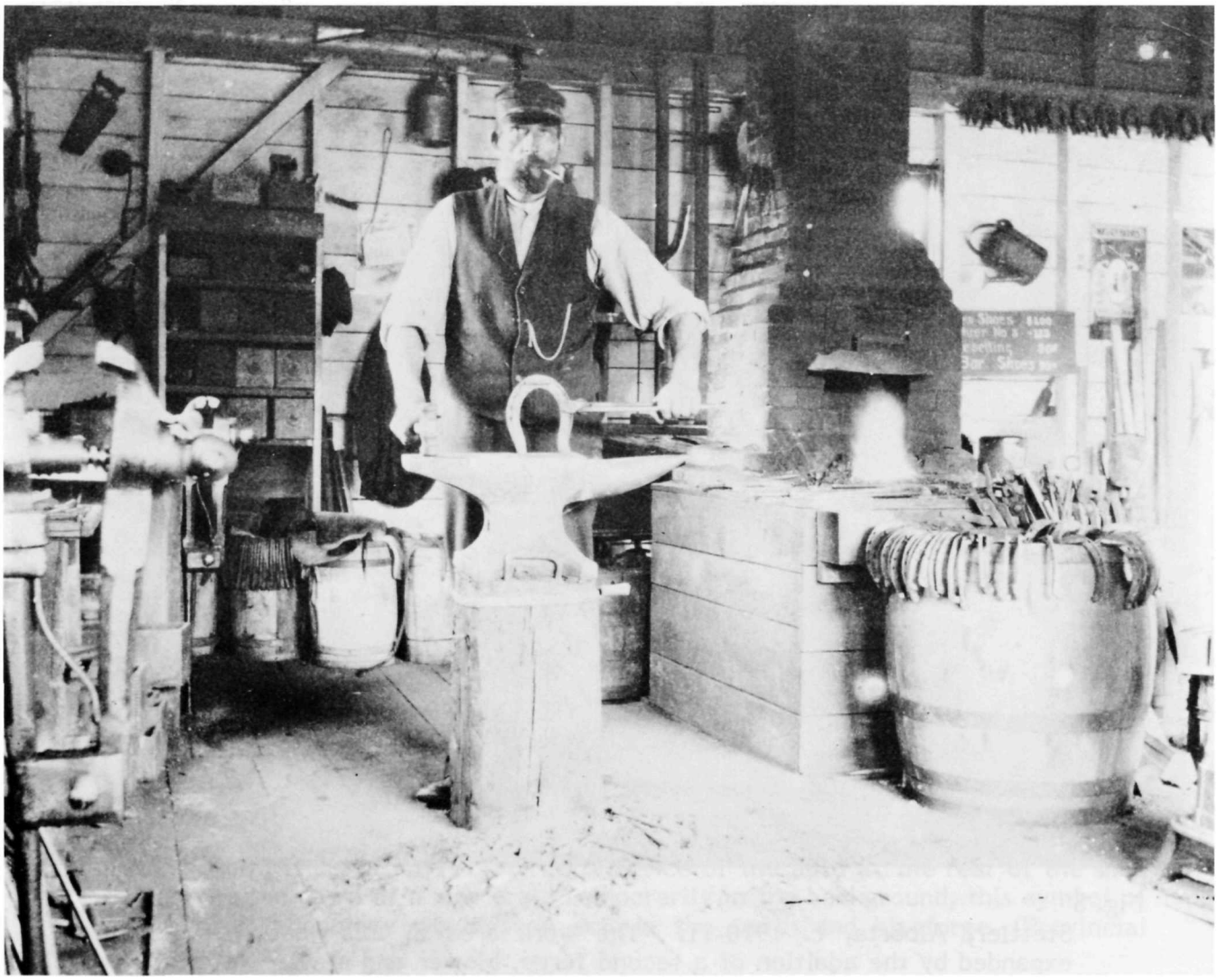


Fig. 7
Shubenacadie, Nova Scotia, 1907. Note the price list for various shoeing services posted behind the forge on the right. (Public Archives of Nova Scotia)

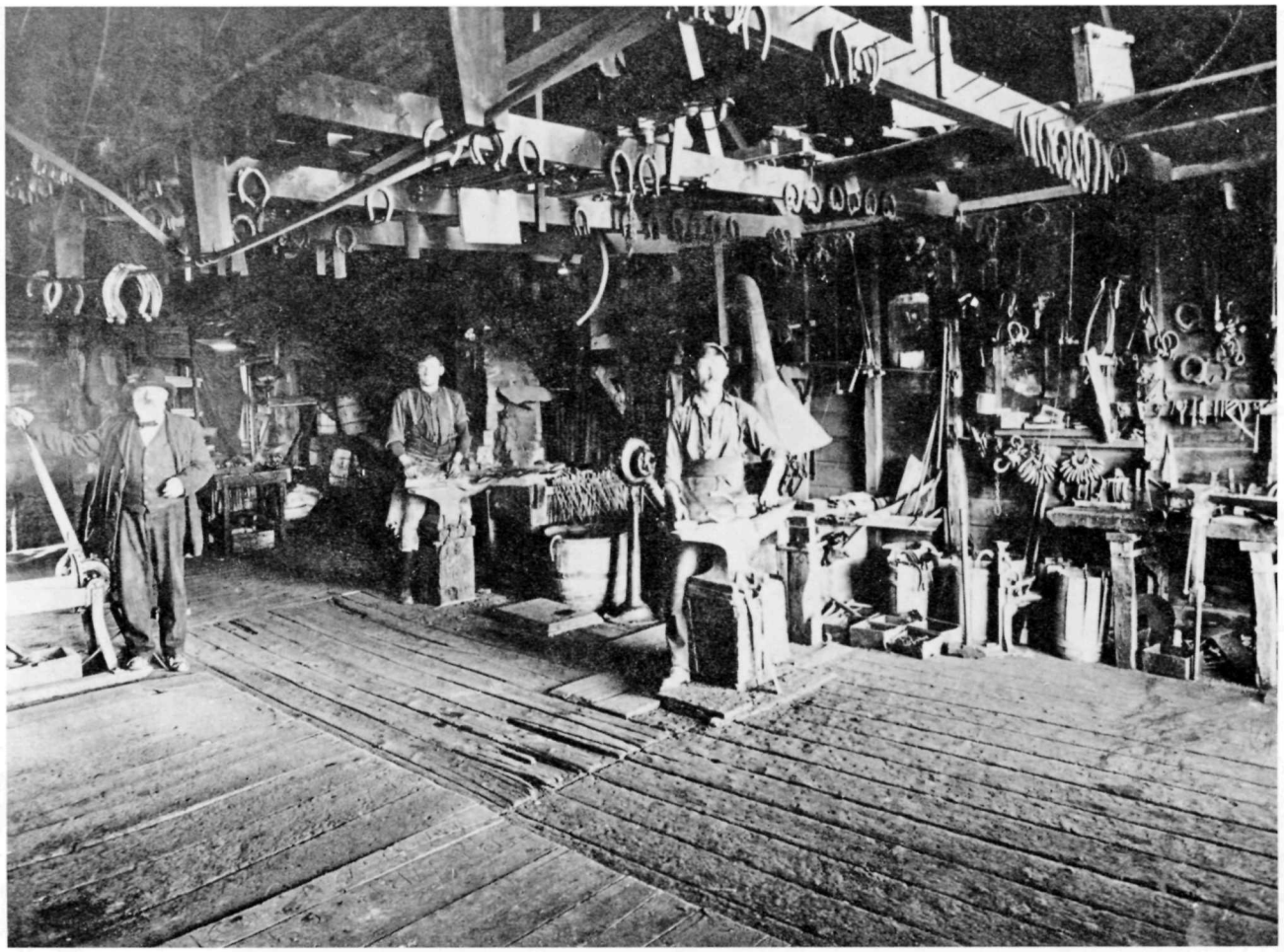


Fig. 8

Stettler, Alberta, c. 1910-11. The work area in this neat shop has been expanded by the addition of a second forge, blower and anvil. Note, however, that the smiths share certain essential elements (eg. the slack tub and probably the fuel). The empty area in the foreground is a wagon bay, itself part of the work area. (Glenbow-Alberta Institute)

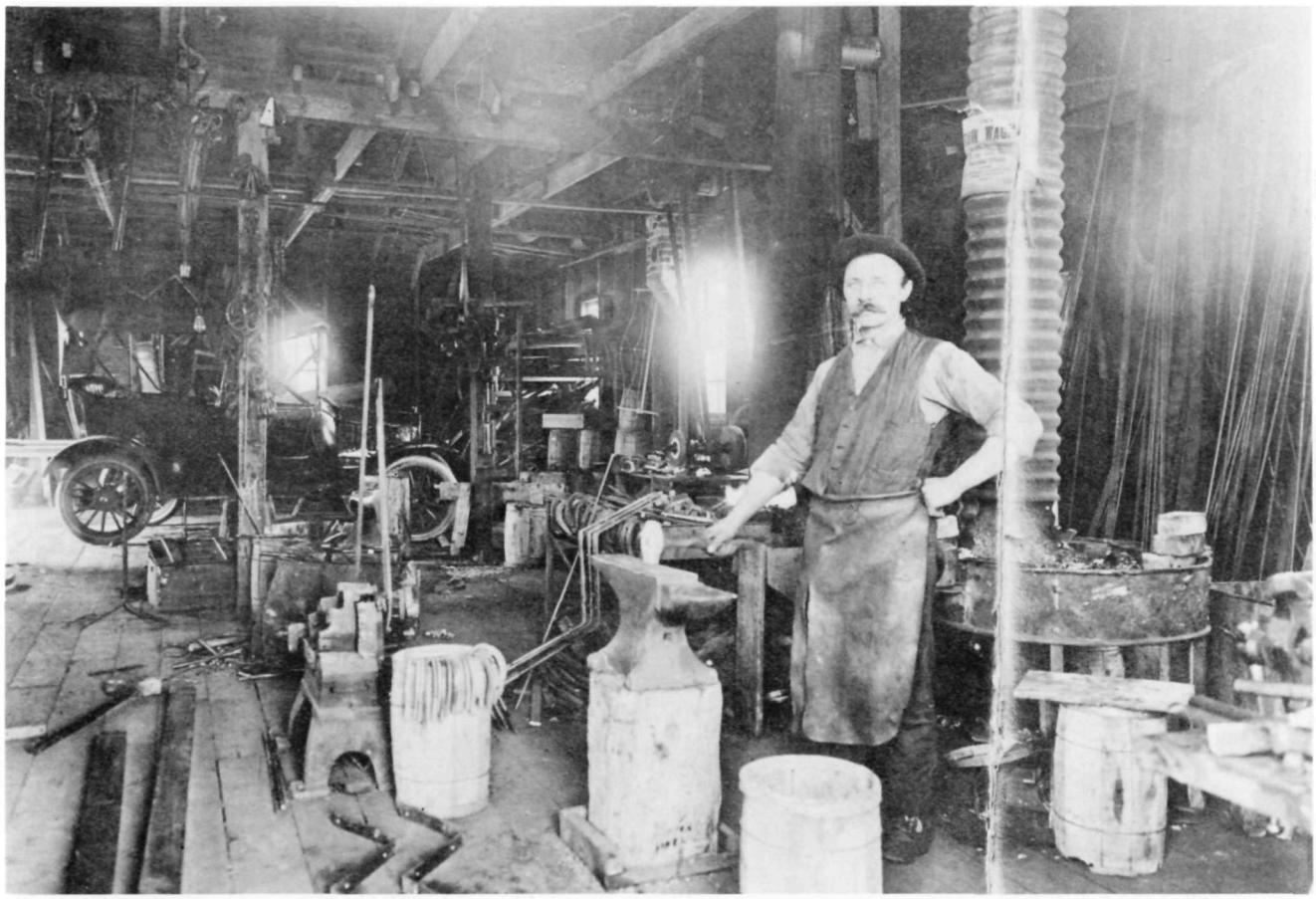


Fig. 9

Edmonton, Alberta, c. 1914. The presence of the auto at the rear of the shop reflects the dawn of a new era. Temporarily in the background, this symbol of the new technology would soon eclipse the smith and his forge. (Provincial Archives of Alberta)

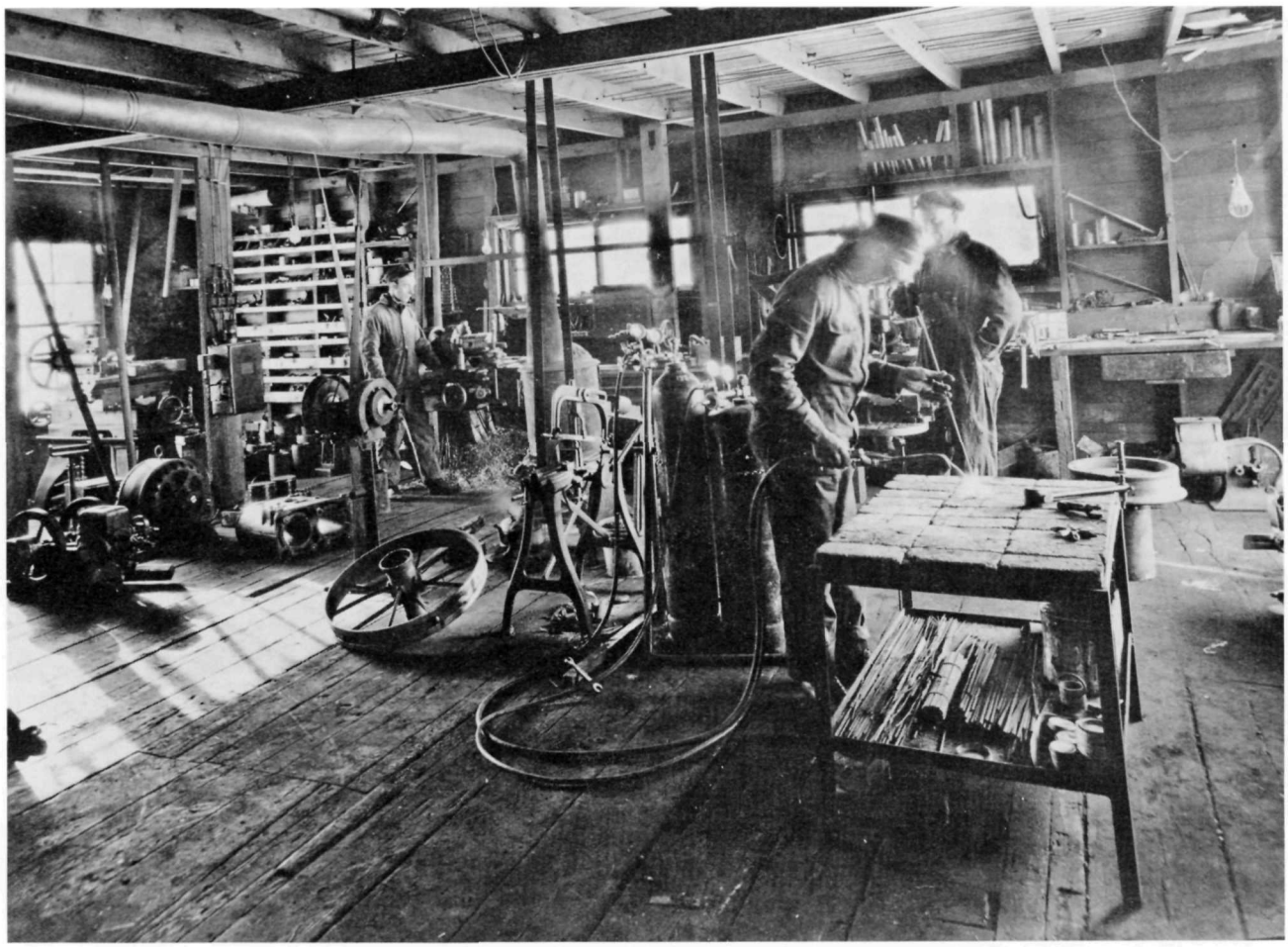


Fig. 10
Camrose, Alberta, 1919. Smith replaced by the Machine Shop: note the modern metal-working equipment including the oxyacetylene torch which replaced the traditional method of welding by heating and hammering. (Glenbow-Alberta Institute)

Fig. 11

Forge Shop, Algoma Steel Corporation Ltd., Sault Ste. Marie, Ontario, c. 1918. In the 20th century, the traditional techniques hung on stubbornly for custom-work which could not be duplicated with standardized machine-made parts. However, the working environment often changed. Instead of bossing himself in his own small shop, the smith tended to become one of many wage-earners in the dingy, noisy environment of the early factories. (Public Archives of Canada, PA-29350)

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