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#### *About the Institute*

The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.



Dear Friend,

The Ku Klux Klan has been "born again" and is openly flouting its racial hatred.

This winter, a group of newsmen were led blindfolded into a secret well-guarded military camp deep in the kudzu vine-covered hills of north Alabama.

High powered rifles echoed above the hollows that hide the Ku Klux Klan's training camp from public view. They train with AR-14 semi-automatic weapons, civilian versions of the Army's M-16. Klansmen, putting aside the usual white robes for camouflaged military fatigues, run obstacle courses, climb walls of logs, crawl beneath canopies of barbed wire and swing on ropes across creeks.

Klansmen have named their secret training camp My Lai, in honor of the Viet Nam village where American soldiers massacred women and children.

According to Terry Tucker, the Commander-in-Chief of the Klan Special Forces, his elite group is undergoing training for a "race war". In addition to the Klan's main military camp in Alabama, they operate similar camps in several other states including one near Houston, Texas where Boy Scouts were taught how to choke their victims and to fire powerful weapons.

Expectant mothers vow to raise their unborn children to hate "niggers and Jews" (envelope photo). And militarily attired Klan Special Forces openly intimidate blacks in small Alabama towns (photo above).

The Klan is growing at an alarming rate to very dangerous levels.

HF 5486  
. B7 M33

Mr. Coker

Subs. books and the knowledge Exp.

p. 17 Mr. Compton in 1939 mentioned  
that the cost of making encyclopedias  
could go as high as \$1,000/page and  
can personally testify that today  
the per page figure can exceed \$600.  
... — this before any sets are  
printed.

? Does this mean before any  
type is set. Presumably yes, for  
as the subsequent sentence only  
preparation of text, photographs,  
color originals and transparencies  
are mentioned.

50000 set runs are required  
to keep cost down to public demand

\* F. E. Compton, in Subs. books My Publ. Hts.,  
1939, good bibliog. on p. 151-154 (in general  
a good book, but a full set)

good  
short  
book

Linnaeus on Sumptuous Books

Excerpts from the dissertation, Incrementa botanices (1753)  
as revised in Amoenitates academicae 3: 390-93. 1756.

John L. Heller

And so we have completed the principal epochs of Botany in as short a space as possible, as if for a chart to be hung on the wall, and its principal Authors, those which are indispensable for persons who would be proficient in this science. But before I lift my hand from the desk, as they say, I will also indicate in a few words how in my opinion that costly invention of engraving ILLUSTRATIONS in copper and printing them is now ending in luxury (and) the ruin, as it has of several kingdoms, so too, perhaps, of this noble science itself. For in the old days, figures were cut only on wood; these represented their plants elegantly, though not with respect to their smallest parts, as in the work of Brunfels, Fuchs, Clusius, Rudbeck, etc. At that time, too, figures were transferred by trade from one owner to another and rearranged as each person desired.

Plantin, the printer of Antwerp, acquired a large stock, for his time, of woodcut figures, thereby reducing the cost of the many botanic works which were published at that time under his care and expense. For Clusius, offering at Loë's press a French translation of Dodonaeus's history, borrowed several figures from Fuchs, all of which Plantin subsequently bought. The same Clusius also published his own History at the house of Plantin himself. Plantin also contracted for the cutting on wood of Lobelius' figures. ...

One cannot deny that those costly figures, which the more Recent Authors have engraved on copper, are much better than those of the Early Botanists, because with copperplates more of the smallest parts can be rendered than with woodcuts, and more distinctly. Their use, however, has so increased the price of books that not a few Sons of Botany who are reared in modest circumstances are compelled to do without such sumptuous books. I call to witness the experience of a person in this situation who set out to purchase the work of Besler, of Barrelier, the History of Morison, the Phytographia of Plukenet, the Gazophylacium of Petiver, the Ordines of Rivinus, the Gardens of the Commelins, the Malabaricus of Rheede, the America of Plumier, the Centuria of Breyne, the Elthamensis of Dillen, the Amboina of Rumphius, the Jamaica of Sloane, the Danubius of Marsili, and especially the handcolored works such as Catesby's Carolina, Martyn's Centuria, Seba's thesaurus, Ehret's Plates, and also Blackwell's Herbal and Weinmann's Phytanthozaiconographia---when adding up their prices, they come to a sum sufficient to buy a reasonably complete Library in any other discipline whatever. And those who have treated ZOOLOGY, though they are few, have now nevertheless raised the cost of books in that science to such an extreme that only students supported by great wealth can acquire them; by way of example we will cite Rumphius, Gualtieri, d'Argenville, Buonanni, Lister on the Testacea; Swammerdam, Réaumur, Roesel, Albin, Edwards, Mme. Merian, Wilkes, Willughby, and a long line of others on Insects and Birds, whose total cost certainly exceeds a thousand ducats. And so if science is ever to be spread abroad, it is necessary for Systematists also to stand by her side with their labor, lest she be ruined in the end by her own splendor. Once the

COPY, COPY, COPY, FOR COPY'S SAKE

From the New York Evening Post, June 25, 1812.

Cambridge, June 20. The Harvard Crimson reports that in a mock battle at the Commons last Friday in celebration of the Battle of Bunker Hill (Col. William Prescott, Commander of Revolutionary Forces) Prescott's grandson, W. H. Prescott, sustained a serious injury to his left eye when an upper classman scored a 'Prescott's eye' with a piece of bread. Prescott will lose the sight of the stricken "ocular", and that of his right will deteriorate during his lifetime until, before his death in 1859, he will be able to use it only one hour a day a few minutes at a time. Prescott will study in his father's law office, but he will eventually devote his almost sightless life to the history of Spain in the 15th and early 16th centuries. He will fortunately have the means to employ scholarly clerks to assist him. Still, he will have to memorize almost word-for-word up to 50 or 60 pages at a time of materials read to him, in order that he may select from them the matter he will need to use in writing his fascinating accounts of Ferdinand and Isabella, the Conquest of Mexico, the Conquest of Peru, and numerous book reviews, many, themselves, small books on their subjects.

How fortunate for society the sure aim of that Harvard upper classman and the date of Prescott's nativity, a century and a half before the age of electroprint [sic] copying machines, which, it seems, will require no memory nor even very much knowledge of the content!

# Book News

## *Early State Geological Survey Publications*

By GEORGE W. WHITE

A LARGE body of early American science is contained in the publications of the state geological surveys, the first of which was established almost 150 years ago. Although generally regarded as technical reports of only local interest, these early publications contain historical matter of wider interest and deserve much more attention than they have received from libraries, collectors, historians of science, and geologists.

Information on geology and mineral resources were only incidental parts of the reports of the government exploring expeditions of Lewis and Clark, Stephen H. Long, and others. The first federal government reports dealing primarily with geology were those of George W. Featherstonhaugh in 1835 and 1836, followed by those of D. D. Owen in 1840 and 1848. Even earlier several of the states made appropriations for the investigation of mineral resources and of the geological framework which is necessary to understand these resources. The first state survey was authorized in 1823 in North Carolina, but it was in the decade of the 1830's when almost all the states east of the Mississippi established geological surveys and published reports varying in length and scope. Their state geologists and associates were generally outstanding scientists, some of whose most important work appeared in the state survey reports.

The history of the various state geological surveys will be found in G. P. Merrill, *Contributions to a history of American state geological and natural history surveys*, Smithsonian Institution, U. S. National Museum, Bulletin 109, 1920. This contains information about the establishment of each of the state surveys, their staffs, and portraits. However, the information on publications of these surveys is meager and scattered through the text without bibliographic citations. The material on the early surveys that Merrill included in his book, *The first one hundred years of American geology*, 1924 (reprinted, 1964), is more lively and forms a good starting point for study of the early history of the surveys. (Additional information will be found in C. W. Hayes, *The state geological surveys of the United States*, U. S. Geol. Survey Bull. 465, 1911, and in W. B. Hendrickson, *Nineteenth-century state geological surveys*... *ISIS*, Vol. 62, p. 357-371, 1961. See also G. W. White, *Reference books for history of geology*, *Stechert-Hafner Book News*, Vol. 18, Nov. 1963, p. 29-30).

The indispensable reference work is by Max Meisel, *A*

*bibliography of American natural history, the pioneer century, 1769-1865*... 3 vols., 1924, 1926, 1929. Happily, this great work has just been reprinted and is again available. It is the best source for references of history and early publications of state geological surveys, of scientific societies, of journals and of many other important matters. Volume I includes a bibliography of publications and histories of institutions with an elaborate index and a bibliography of biographies (additions will be found in Volume III, p. 703-730). Volumes II and III give a brief history of each institute, survey, expedition and organization, and a critical bibliography of histories of each. For each organization there is an annotated list of publications with table of contents of each. Volume III includes an index of authors and naturalists with reference to all of their books and journal articles, and an index of institutions.

Meisel gives bibliographical details for most of the survey publications—pages, maps, and illustrations. The earliest state (as well as federal) reports present bibliographic complexities. The number of illustrations varies—some maps and sections are colored, some are not; some have extra plates, both colored and uncolored; some have extra additions; some have parts published together or separately. An example is the *Massachusetts Report*, 1833, of which some copies have 692 pages and some (as listed in Meisel) have 700 pages, because a final "Animal List" is included. Therefore, a library or a collector located in a given state could perform a real bibliographic service by collecting not just one copy of the early reports, but several of each in order to compare them. I think there must be at least six variants of *Ohio Report 2*, 1838; perhaps there are more. The problem with some of the reports with many plates is not to find variants, but to find two copies exactly alike!

Illustrations in the reports are not only interesting but valuable. Many are wood engravings, some are steel engravings. The maps and sections were colored by hand, as were all maps before 1850 and therefore copies of the same map differ in greater or lesser degree—some are brighter than others, and some are only partly colored and some have no color at all. Some illustrations, such as those of the Arkansas Survey by D. D. Owen, who was an accomplished artist, are charming lithographs which have considerable merit and are desired by print collectors.

The writing in many of the early reports was personal and

Bei der Verführung eines rationalen Leitkartensystems für systematische Kataloge in den „Nachrichten für Dokumentation“ (Jg. 2, H. 2 vom Juni 1951) blieb die Frage der zweckmäßigsten Beschriftung unerörtert. Auch hierfür läßt sich ein neuer Weg aufzeigen.

Die Beschriftung von Leitkarten kann auf dreifache Weise geschehen: 1. durch unmittelbare Beschriftung des Kartons, 2. durch Verwendung von Metallfahnen und Einschiebezetteln, 3. durch Aufkleben von Zetteln.

Die unmittelbare Beschriftung läßt sich handschriftlich, mittels Schreibmaschine oder Druck (Buchdruck oder Stempel) ausführen. Mit der Schreibmaschine ist unmittelbare Beschriftung jedoch nur möglich, wenn dünner — wenig haltbarer — Karton verwendet wird.

Am häufigsten verwendet findet man in Bibliotheken die Preßspanleilkarten mit aufgenieteter Metallfahne, Einsteckchild und (farbigem) Celluloid-Schutz. Die Ein-

schiebezettel werden mit der Schreibmaschine oder mit der Schreibfeder beschriftet, zumeist mit der Feder in enger Schreibschrift.

Besonders praktisch und zukunftsreich erscheint mir die Beschriftung durch Aufkleben von Zetteln, wodurch die neuen Metallfahnen entbehrlich werden. Mit der Schreibmaschine oder im Akzidenzdruck lassen sich saubere Katalogüberschriften (Rubriken) herstellen.

Die für den Kopf der Leitkarte bestimmten Zettel mit Katalogüberschriften (Rubriken) nenne ich hier *Rubrikzettel*. Um diese kleinen Zettel mit der Schreibmaschine beschriften zu können, müssen sie zunächst ganze Bogen, *Rubrikbogen*, bilden, die man in die Schreibmaschine spannt.

Zur Beschriftung der 5 Leitkartenmuster I—V des rationalen Leitkartensystems benötigt man 3 *Rubrikmuster*, bezeichnet als Muster A, B und C.

DK 016 : 58

## Die botanische Bibliographie

Von Dr. Claus Nissen, Mainz

Die Bibliographie der botanischen Literatur hat sich von früh an in guten Händen befunden. Als ihren Begründer darf man — *cum grano talis*; denn vorher erschien schon der umfangreiche Verkaufskatalog der „*Bibliotheca Riviniana*“, Lipsiae (1727), 740 S. — Linné selbst ansehen mit seinen zahlreichen Rezensionen und den über 1000 Titeln seiner „*Bibliotheca botanica*“ (Amstelodami 1730, 168 S.; 2. Aufl. 1751 und 1753, 330 S.). Auch J. Fr. Séguier's gleichnamiges Werk (Hagae Com. 1740; ed. 2, opera L. T. Gronovii, Lugduni Bat. 1760, 580 S.) und Christ. Jak. Trewe's „*Librorum botanicorum Catalogus*“ (Norimbergae 1752—57, 3 Tle; ein rarissimum, separat aus der von Trewe angeregten Neuausgabe des Blackwell'schen Kräuterbuches) sind mit bibliographischer Sorgfalt und höchster Sachkenntnis zusammengestellt, so daß sie in Zweifelsfällen noch immer zu Rate gezogen werden müssen. Es folgte Albrecht v. Hallers „*Bibliotheca botanica*“ (Tiguri 1771—72, 2 Bde), die noch in unserm Jahrhundert die Mühe eines Registers lohnte (Bernae 1903, 57 S., von Jens Christian Bay, einem gebürtigen Dänen, bis 1947 Leiter der John Crerar Library in Chicago). Nach den Zusammenstellungen von Friedr. v. Miltitz (Berlin 1829, 544 Sp.), Pritzel's Mentor J. H. Dierbach (Leingo 1836, 268 S.) und Marcus Sal. Krüger (Berlin 1841, 464 S.) erschienen dann Georg Aug. Pritzel's klassischer „*Thesaurus literaturae botanicae*“ (Lipsiae 1851, 547 S.), der in den folgenden 3 Jahrzehnten die Grundlage aller bibliographischen Arbeit in der Botanik gebildet hat. Ernst A. Zucholdt und Ernst v. Berg lieferten Nachträge (1853 und 1868 bzw. 1859—64), die von Pritzel mit den Früchten seiner eigenen Sammeltätigkeit zur endgültigen, von Karl Jessen beendeten Neuausgabe (1872—77, 576 S.) verarbeitet wurden. Obwohl un Gartenbau- und Landwirtschaftsliteratur vermindert, ist diese bis heute als zuverlässiger Führer durch die ältere botanische Literatur in Gebrauch (ein Neudruck ist in diesem Jahr noch

in Mailand erschienen). Daß die Aufgabe einer Gesamtbibliographie jedoch damals schon die Kräfte selbst eines so unerfülllichen Arbeiters, wie Pritzel es war, überstieg, zeigt Benj. D. Jackson's „*Guide to the literature of botany*“ (Index Soc. Publ. 8, London 1881, 626 S.), der noch 6000 neue Titel hinzufügen konnte. Seitdem hat sich niemand mehr an diese Mühsal gewagt, so daß sich die botanische Bibliographie aufspalten mußte in die periodischen Referatenblätter und Fortschrittsberichte einerseits und die regionalen und thematischen Spezialbibliographien andererseits.

Einen gewissen Ersatz bilden — wenigstens für das selbständige Schrifttum — die Kataloge größerer Spezialbibliotheken. Als Vorbild an Akribie und Ausführlichkeit darf Jonas Dryander's „*Catalogus bibliothecae Jos. Barksi*“ (Bd 2: Botanik, 1796) gelten. Ihre heutigen wichtigsten Vertreter sind die der großen Londoner Sammlungen: der Royal Botanical Gardens in Kew (1899, 790 S.; Suppl. 1919), der Linnean Society (New ed. 1925, 860 S.), der Lindley Library der Royal Horticultural Society (1927, 488 S.; neue Aufl. in Vorbereitung) und vor allem des British Museum (Natural History) in South Kensington 1903 ff., 5 Bde und 3 Bde Suppl.). Zu ihnen gesellen sich der Utrechter Gesamtkatalog: „*Catalogus van botan. boekwerken in de Univ.-Bibl.*...“ (1936, 294 S.) und die großen amerikanischen Kataloge der Massachusetts Horticultural Society (Cambridge, Mass. 1918 bis 20, 587 S., compiled by W. P. Richard and Mary C. Hewett) und des Arnold Arboretum der Harvard University in Jamaica Plain (Cambridge, Mass. 1914—33, 3 Bde, 4<sup>te</sup>, comp. by Ethelyn M. Tucker; mit vorliegendem „*Subject catalogue*“ in Bd 2, 1917, 542 S.).

In diesem Zusammenhang sei auch einer Katalog-Erwählung, getan, die sich an unmittelbarer Vermittlung des Schrifttums selber — nicht Titel — zur Aufgabe gesetzt hat: der Verkauf der großen Antiquariate. Vor den Biblio-

## On a sunny Monday morning . . .

an attractive young woman was in her car, returning from a family gathering. At that moment, she had everything to live for—four young children and a strikingly handsome husband, who just happened to be the Mayor of the city they both loved.

Suddenly over the car radio came an abrupt announcement: "*We interrupt this program for a news flash: George Moscone, Mayor of San Francisco, has just been shot and killed at City Hall.*"

Yes, that is how Gina Moscone first learned of the unspeakable loss she and her family were to suffer as victims of a handgun murder. And their enormous personal tragedy was shared by the entire City of San Francisco, which also lost Harvey Milk, a member of the City's Board of Supervisors, in that same shooting incident. While Mr. Milk had no wife or children, that night 30,000 of his constituents marched in silent testimony to their loss.

As a stunned city reeled from these crushing blows, the question most asked was how could two high officials be slain right inside their offices in a highly guarded City Hall? The answer was all too simple: the weapon was an easily concealed handgun. The murderer could not have carried a rifle or shotgun into the building; it would have been noticed. Of course, he could have attacked Mayor Moscone with a knife, but the Mayor was a young, vigorous athlete and could have put up a strong fight or, at least, summoned help. However, with a concealed handgun, the Mayor did not have a chance. And the murderer could then walk through the corridors of City Hall to Mr. Milk's office and there snuff out his life, too.

BUT . . . although handguns are the most-used weapon for political assassinations—from Abraham Lincoln to Robert Kennedy to Moscone and Milk—they are also the weapon used in the injury, rape or death of 300,000 ordinary Americans every year. And while the killings of prominent Americans make headlines and merit national TV coverage, nearly 20,000 others die of handgun deaths every year—their lives passing almost unnoticed by the public, but each a deep tragedy to family and friends. People like . . .



**Bryant Wayne Russell**, an 18-year-old Baltimore youth, senselessly slain by an angry motorist after a minor traffic mishap.



**Dr. Jerome Harris**, an 81-year-old Fort Worth dentist, shot to death in a robbery attempt on his office.



**Wendy Day**, an innocent California 8-year-old, killed by her grandmother who was trying to intervene in a domestic argument between the child's parents.



**Carson Smith, 63, and Gregg Moore, 21**, owners of adjoining farms in Jackson, Mississippi, who killed one another over a boundary line disagreement.

or ??????????????, the man, woman or child who will needlessly die during the next 24 hours because one of the 50 million handguns in the United States—in the hands of a criminal or drug addict, in an automobile glove compartment, in a nightstand, in a closet supposedly hidden from a child—will fire and take its toll.

Help stem the rising tide of handgun violence that is engulfing our country and our lives. Join **Handgun Control, Inc.** Today.

**Handgun Control, Inc.**

810 18th Street, N.W. Washington, D.C. 20006

Van Schaack, G. B.

Math 3

Feb. 21/28.

5

4).

Normal form of parabolic transf. is

$$w' = w + c$$

Double element,  $E_w$ , has coord  $\infty: (1, 0)$

Take an arb. el.  $E$  with coord  $w$ .

$$\text{Let } E \rightarrow E': w'$$

$$\text{and } \bar{E} \rightarrow E, \bar{E} \text{ with coord } \bar{w}.$$

To show that

$$(E_w E, E' \bar{E}) = -1$$

$$\text{Now } (E_w E, E' \bar{E}) = (E' \bar{E}, E_w E)$$

But  $E_w$  sep.  $E'$  and  $E$  in ratio 1.

$$\therefore (E' \bar{E}, E_w E) = \frac{E \bar{E}'}{E E'} = \frac{w - \bar{w}}{w - w'}$$

$$\text{But } w' = w + c$$

$$w = \bar{w} + c$$

$$\bar{w} = w - c$$

$$\therefore \frac{E \bar{E}'}{E E'} = \frac{c}{-c} = -1 \text{ and } (E_w E, E' \bar{E}) = -1$$

Q. E. D.

1)  $w_1 = 1, w_2 = 4, k = -1$

Then  $\frac{w' - 4}{w' - 1} = \frac{4 - w}{w - 1}$

$$w'w - 4w - w' + 4 = 4w' - 4 - ww' + w$$

$$(2w - 5)w' = 5w - 8$$

$$w' = \frac{5w - 8}{2w - 5} \quad \text{Ans.}$$

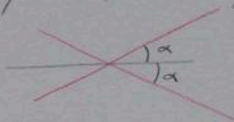
2) Involution  $w' = -w$ .

This is the normal form of the hyperbolic involution.  
 If  $w$  is interpreted as metric caused on a line  
 the involution is the set of the pairs of pts on the line  
 which are equidistant from the origin.  
 The fixed pts are the origin and the pts at inf. on the  
 line.

3)  $w' = -w$ .

Interpreted as metric caused in a pencil of lines  
 the involution is the set of pairs of lines equally  
 inclined to the prime line.

The fixed lines are the prime line  
 and the line  $\perp$  to the prime line.



Van Schaack, G. B.

Math 3. 5

Feb. 18/28.

$$H) \quad E_1: w_1 = 1+i$$

$$E_2: w_2 = 1-i$$

$$k = i$$

$$\text{Then } \frac{w' - 1 + i}{w' - 1 - i} = i \frac{w - 1 + i}{w - 1 - i}$$

$$w w' - w + i w - w' + 1 - i - i w' + i + 1 = i w' w - i w' - w' - i w + i + 1 + w - 1 + i$$

$$(w - 1 - i - i w + i + 1) w' = w - i w - 1 + i - i - 1 - i w + i + 1 + w - 1 + i$$

$$w(1-i) w' = 2w - 2i w - 2 + 2i$$

$$= 2w(1-i) - 2(1-i)$$

$$w' = \frac{2w - 2}{w} \quad \underline{\text{Ans}}$$

3)

$$E_1: w_1 = 1$$

$$E_2: w_2 = -1$$

$$p = 2$$

$$\frac{w' - w_2}{w' - w_1} = p \frac{w - w_2}{w - w_1}$$

$$\frac{w' + 1}{w' - 1} = 2 \frac{w + 1}{w - 1}$$

$$w'w - w' + w - 1 = 2w'w - 2w + 2w' - 2$$

$$-w'w - 3w' = -3w - 1$$

$$w' = \frac{3w + 1}{w + 3} \quad \underline{\text{Ans}}$$

1)

$$w' = \frac{4w-2}{w+1}$$

Let  $w' = w$ 

$$\text{Then } w^2 + w = 4w - 2$$

$$w^2 - 3w + 2 = 0$$

$$w = 1 \text{ or } 2$$

Fixed elements have case: 1, and 2, Ans

$$k = \frac{w - w_1}{w - w_2} \cdot \frac{w' - w_2}{w' - w_1}$$

$$\text{Let } w = 0, \quad w' = -2$$

$$w_1 = 1, \quad w_2 = 2$$

Then

$$k = \frac{-1}{-2} \cdot \frac{-4}{-3} = \frac{2}{3} \quad \underline{\text{Ans}}$$

2).

$$w' = -\frac{w+\sqrt{-5}}{w+1}$$

$$\text{Let } w' = w$$

$$\text{Then } w^2 + 2w + \sqrt{-5} = 0$$

$$w = \frac{-2 \pm \sqrt{-16}}{2}$$

$$= -1 \pm 2i$$

$\therefore$  Fixed elements have coords:  $-1+2i$ , and  $-1-2i$ .

$$k = \frac{w-w_1}{w-w_2} \cdot \frac{w'-w_2}{w'-w_1}$$

$$\text{Let } w' = 0, \quad w = -5$$

$$w_1 = -1+2i$$

$$w_2 = -1-2i$$

$$\text{Then } k = \frac{-5+1-2i}{-5+1+2i} \cdot \frac{1+2i}{1-2i}$$

$$= \frac{2+i}{2-i} \cdot \frac{1+2i}{1-2i}$$

$$= \frac{2+5i-2}{2-5i-2} = -1 \quad \text{Ans.}$$

11. Given the two conj. imag numbers

$$a = a_1 + ia_2$$

$$\bar{a} = a_1 - ia_2$$

To prove  $\frac{a}{\bar{a}} = -1$  if real.

Then  $a_2 \neq 0$ .

1. If  $a_1 \neq 0$ ,

$$\frac{a}{\bar{a}} = \frac{a_1 + ia_2}{a_1 - ia_2} = \text{an imag. number.}$$

2. If  $a_1 = 0$ ,

$$\frac{a}{\bar{a}} = \frac{ia_2}{-ia_2} = -1$$

Both 1) and 2) are the only possibilities.

$\therefore$  if  $\frac{a}{\bar{a}}$  is real it is equal to  $-1$ .

Q. E. D.

2). Given the four elements

$$\begin{array}{cccc} E_1 & E_2 & E_3 & E_4 \\ \text{coordinates} & a & b & a' & b' & a' \text{ and } b' \text{ conj. imag.} \end{array}$$

Since we are considering their cross ratios they must be four elements of one group - a range of  $\rho$  or pencil of lines, etc.

$\therefore$  their equations can be written

$$E_1: a$$

$$E_2: b$$

$$E_3: a + i\lambda b$$

$$E_4: a - i\lambda b$$

restricted.  
your  $\lambda$  may not be real,  
and you then apply the  
preceding exercise.

$$\text{But then } (E_1, E_2, E_3, E_4) = \frac{i\lambda}{-i\lambda} = -1$$

2-Ed.

$$u = \frac{(u_3' - a_1')(u_4' - a_2')}{(u_3' - a_2')(u_4' - a_1')}$$

$$= \frac{a_1 u' + a_2}{b_1 u' + b_2}$$

or (2)  $u' = \frac{c_1 u + c_2}{d_1 u + d_2}$

But (2) is linear.

c) Change from a proj. coord.  $u$  to a proj. coord  $u'$ .

By b)  $u \rightarrow \bar{u}$  by a linear transf. ( $\bar{u}$  a metric coord).

a)  $\bar{u} \rightarrow u'$  " " " " " "

But the product of ~~two~~ linear transf. is a linear transf.

$\therefore u \rightarrow u'$  by a linear transf.

Q. E. D.

Van Schaack, G. B.

Math 3

Feb. 16/28.

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$$\text{Ex. 1. } x' = \frac{2x-4}{x-1}$$

$$P_0': 0 = \frac{2x-4}{x-1}$$

$$x = 2 \quad \underline{\text{Ans.}}$$

$$P_1': 1 = \frac{2x-4}{x-1}$$

$$x-1 = 2x-4$$

$$x = 3 \quad \underline{\text{Ans.}}$$

$$P_w': \infty = \frac{2x-4}{x-1}$$

$$0 = \frac{x-1}{2x-4}$$

$$x = 1 \quad \underline{\text{Ans.}}$$

$$x x' - x' = 2x - 4$$

$$x = \frac{1-x'}{2-x'}$$

$$P_0: 0 = \frac{1-x'}{2-x'}$$

$$x' = 1 \quad \underline{\text{Ans.}}$$

$$P_1: 1 = \frac{1-x'}{2-x'}$$

$$2-x' = 1-x'$$

$$x' \rightarrow \infty \quad \underline{\text{Ans.}}$$

$$P_w: \infty = \frac{1-x'}{2-x'}$$

$$0 = \frac{2-x'}{1-x'}$$

$$x' = 2 \quad \underline{\text{Ans.}}$$

Ex. 2.

$$P_w \rightarrow 3$$

$$P_o \rightarrow -2$$

$$P_i \rightarrow \sqrt{5}$$

Then  $(P_w P_o, P_i P) = (3) (-2), (\sqrt{5}) (x')$

$$\frac{P_o P}{P_o P_i} = \frac{\sqrt{5}-3}{5+2} \cdot \frac{x'+2}{x'-3}$$

$$\frac{-x}{-1} = \frac{2}{7} \cdot \frac{x'+2}{x'-3}$$

$$7xx' - 21x = 2x' + 4$$

$$x' = \frac{21x + 4}{7x - 2} \quad \text{Ans.}$$

Ex. 3.

Def. Choose three distinct lines thru  $P$  and describe them by  $L_w, L_o, L_1$ . Then the proj. coord.  $u$

of an arbitrary line,  $L$ , thru  $P$  is defined as the cross ratio  $(L_w L_o, L_1, L)$

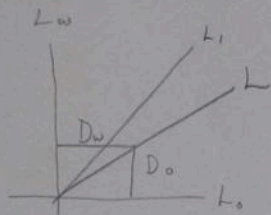
$$u = (L_w L_o, L_1, L)$$

The coord. of  $L_w$  is then not defined ( $\rightarrow \infty$ ).

" " "  $L_o$  " 0

" " "  $L_1$  " 1

If we take  $L_w \perp L_o$  and  $L_1$  bisecting the  $L$  between  $L_w$  and  $L_o$ .



$$u = (L_w L_o, L_1, L) = \frac{L_1 L_w}{L_1 L_o} \cdot \frac{L L_o}{L L_w}$$

$$= \frac{L L_o}{L L_w} = \frac{D_o}{D_w} = \lambda,$$

$\lambda$  being the slope of  $L$  referred to  $L_o$  and  $L_w$  as Cartesian axes.

The metric coord. (slope =  $\lambda$ ) is thus a special case of the projective coord.

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March 3.

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1).  $d_1: x_2 - x_3 = 0$

$a_1: x_1 = 0$

$\therefore$   $a_1$  and  $d_1$  must have coords:

$(0, p, p), p \neq 0$ . Ans.

2.) Har. conj. of  $d_3$  with respect to  $a_1$  and  $a_2$ .

$a_1: x_1 = 0$

$a_2: x_2 = 0$

$d_3: x_1 - x_2 = 0$

$d_3$  is in form  $x_1 + \lambda, x_2 = 0$ .

$\therefore$  the harm conj. of  $d_3$  must be  $x_1 - \lambda, x_2 = 0$

or  $x_1 + x_2 = 0$  Ans.

3.)  $l: x_2 - 2x_3 = 0$ . What line?

$a_2: x_2 = 0$

$a_3: x_3 = 0$

$d_1: x_2 - x_3 = 0$

$l: x_2 - 2x_3 = 0$

$l$  is a line then  $A$ , such that  
the cross ratio

$(a_2, a_3, d_1, l) = \frac{-1}{-2} = \frac{1}{2}$ .

1. upper oven clean.
2. edge to be rep. by me
3. grease  
thin paper
4. grease careful with up & down.
5. only water on kitchen
6. no gn. from above
7. Wash & drainage
8. crates in place
9. my money
10. yellow to form

But  $P'$ , the midpt of  $P_1, P_2$  has coords

$$x' = \frac{1}{2} \cdot \frac{x_1 y_2 + x_2 y_1}{k_1 k_2}$$

$$y' = \frac{1}{2} \cdot \frac{x_1 + x_2}{k_1 k_2}$$

If now  $P'$  is to coincide with  $\bar{P}$

the fact. eqn must be true.

$$\frac{1}{2} \cdot \frac{x_1 + x_2}{k_1 k_2} = \frac{2}{x_1 + x_2}$$

$$(x_1 + x_2)^2 = 4 k_1 k_2$$

$$x_1 = x_2$$

But this is true only in a sp. case.

$\therefore$  In genl  $P'$  does not coincide with  $\bar{P}$

and the proj. transf. does not, in genl,  
preserve the property that a pt. be a midpt.

$\therefore$  The property that a pt. be a midpt.  
is an affine property.

DAD

Then  $(P_1' P_2' P_3' P_4') = (P_1 P_2 P_3 P_4) = -1$

But since  $P_4'$  is not the pt at  $\infty$  on the line  
 $P_1' P_2'$ ,  $P_3'$  cannot be the midpt of  $P_1' P_2'$ .  
 Q.E.D.

Anal. Proof.

Take the proj. transf.

$$(1) \begin{cases} \sigma x_1' = x_2 \\ \sigma x_2' = x_3 \\ \sigma x_3' = x_1 \end{cases}$$

$$\text{or } \begin{cases} x' = \frac{x_2}{x_1} = \frac{y}{x} \\ y' = \frac{x_3}{x_1} = \frac{1}{x} \end{cases}$$

$$\text{Then } P_1: (x_1, y_1) \rightarrow P_1': \left( \frac{y_1}{x_1}, \frac{1}{x_1} \right)$$

$$P_2: (x_2, y_2) \rightarrow P_2': \left( \frac{y_2}{x_2}, \frac{1}{x_2} \right)$$

$$P: \left( \frac{x_1+x_2}{2}, \frac{y_1+y_2}{2} \right) \rightarrow \bar{P}: \left( \frac{\frac{y_1}{x_1} + \frac{y_2}{x_2}}{\frac{1}{x_1} + \frac{1}{x_2}}, \frac{2}{\frac{1}{x_1} + \frac{1}{x_2}} \right)$$

Ex. 2.

$$\lim (E_1, E_2, E_3, E_4) = ?$$

$$E_4 \rightarrow E_3$$

$$(E_1, E_2, E_3, E_4) = \frac{E_3 E_1}{E_3 E_2} \cdot \frac{E_4 E_2}{E_4 E_1} = \frac{E_3 E_1}{E_4 E_1} \cdot \frac{E_4 E_2}{E_3 E_2}$$

$$\text{Then } \lim (E_1, E_2, E_3, E_4) = \lim_{E_4 \rightarrow E_3} \frac{E_3 E_1}{E_4 E_1} \cdot \frac{E_4 E_2}{E_3 E_2}$$

$$E_4 \rightarrow E_3$$

$$\text{But } \lim_{E_4 \rightarrow E_3} \frac{E_3 E_1}{E_4 E_1} = 1$$

$$\text{And } \lim_{E_4 \rightarrow E_3} \frac{E_4 E_2}{E_3 E_2} = 1$$

$$\therefore \lim (E_1, E_2, E_3, E_4) = 1$$

$$E_4 \rightarrow E_3$$

Ans.

Ex 2 -  $\lim_{E_4 \rightarrow E_2} (E_1, E_2, E_3, E_4) = ?$

$$\begin{aligned} \lim_{E_4 \rightarrow E_2} (E_1, E_2, E_3, E_4) &= \lim_{E_4 \rightarrow E_2} \frac{E_3 E_1}{E_3 E_2} \cdot \frac{E_4 E_2}{E_4 E_1} \\ &= \frac{E_3 E_1}{E_3 E_2} \cdot \frac{0}{E_2 E_1} \\ &= 0 \quad \underline{\text{Ans}} \end{aligned}$$

$\lim_{E_4 \rightarrow E_1} (E_1, E_2, E_3, E_4) = ?$

$$\begin{aligned} \lim_{E_4 \rightarrow E_1} (E_1, E_2, E_3, E_4) &= \lim_{E_4 \rightarrow E_1} \frac{E_3 E_1}{E_3 E_2} \cdot \frac{E_4 E_2}{E_4 E_1} \\ &= \frac{E_3 E_1}{E_3 E_2} \cdot \frac{E_1 E_2}{\underbrace{E_1 E_1}_0} \\ &\rightarrow \infty \quad \underline{\text{Ans}} \end{aligned}$$

$E_1, E_2, E_3$   
distinct.

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appropriate which  
Economy must be practiced, but not at the cost of this proposal would mount ~~mount~~ <sup>require</sup> ~~up to~~, with its anti-intellectual mechanization. Be mindful that we are talking about the UO Library--by past and present intent a scholarly institution serving scholars in their ~~scholar's~~ endeavors--in the past and in the present the most important library between San Francisco & Seattle. The only comparisons with other institutions I currently know of in which something like this proposal has been adopted are Central State University in ~~State College~~ Oklahoma, and Florida Atlantic University, neither of them members of the club in which UO has been for nearly a century a star in the West. ? Correct name?

The plight of the Library is not unique--it suffers from a national disease I have been observing for many years--overexpansion. The only effective cure is excision of unwise developments. In the late 50s and the 60s university and college libraries all over the US added periodicals by the score when not in hundreds. Now is the day of reckoning, and the path is to cancel subscriptions (and gifts even) which are either of too low grade (another national virus) or so little used as to be unsupportable by collateral funds. If the faculty cannot point out what to discontinue (or even discard) then the state of the University has reached a level where perhaps dehumanization is in order, but I am not willing to believe this <sup>level</sup> has been or need be reached.

A note on a possible contingency. The long fight led by Williams & Wilkins against photocopying has ended in a fizzle, the Supreme Court rendering a tie vote. What is to follow is anybody's guess, for Congress will eventually write a new law of copyright, but when and to what end must be pure speculation. It seems probable to me that the library use of microfilm will be authorized. But it could be microfilm for reading only, not for print-outs. Were this to come AJMP would founder, for one of its stressed 'features' is that he who doesn't want to read a microfilm can make print-out copy immediately at five cents per exposure. I let you guess how many microfilm readers would be needed if no print-outs were to be allowed. Something to think about.

My remarks are too lengthy, but they are only the tip of the iceberg. I hope they will generate in you enough warmth to melt enough of the iceberg to reveal more of it.

I plead with you that you and your Committee examine AJMP with utmost circumspection.

The epilogue (attached) appeared in Punch years ago.