

◇ 독서자료

<과학사통론>

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I. 머 리 말

여기 실린 자료는 필자가 1984 년부터 서울대학교 대학원 과학사 및 과학철학 협동과정의 석사과정 1 학년 학생들을 대상으로 개설하여 운영한 <과학사통론 1>과 <과학사통론 2>의 독서자료이다.

이 두 과목은 매년 각각 1 학기와 2 학기에 개설되었으며 학생들은 1 년간 이 두 과목을 수강함으로써 과학사 분야를 전공할 대학원생으로서 필요한 기초적이고 공통적인 지식을 습득할 수 있도록 했다. 따라서 이들 과목의 독서자료는 과학의 역사상의 주요 사실들에 대한 문헌·사료들을 포함해서 그에 대한 서술·해석 등을 담고 있으며 이들과 관련된 중요한 논쟁들도 포함하고 있다. 이들을 공부함으로써 학생들은 과학사 연구가 취하는 여러 가지 접근방법들도 익힐 수 있을 것이다.

이 과목들을 “독서세미나” 형식으로 운영했으며, 참여하는 모든 학생들이 모두 필수독서자료(“필수독서자료”와 “선택독서자료”의 구별에 대해서는 아래의 “범례”를 참조할 것)를 읽고 세미나에 참석하여 읽은 내용에 대해 토론했다. 1 학기에는 13 주, 2 학기에는 12 주의 독서자료가 주어졌으며, 각 학기의 중간쯤에 1 주씩의 휴식을 가졌다. 학기의 끝에는 정리와 보고서 작성을 위해 2~3 주씩이 할당되었다. 학생들은 이들 과목을 수강하는 동안 많은 시간을 이들 과목의 준비에 할애했으며, 이들 과목을 성공적으로 마친 후에 보다 더 전문적인 세부분야의 공부와 연구에 착수하게 되었다.

그 동안 이 과목들을 수강한 학생들은 모두 대학원과정 학생들이었지만, 과학사 전공의 학부과정이 국내에 존재하지 않는 상황 때문에 대부분의 학생들이 과학사 분야의 충분한 기초지식을 결여하고 있었다. 심지어 초기에는 학부과정에서 한 두권의 과학사 개설서를 읽은 것이 전부인 학생들도 어쩔 수 없이 이 과목들을 수강해야 했다. 따라서 여기 실린 독서자료들은 학부 수준에서 당연히 읽었으리라고 기대할 만한 수준의 초보적인 내용들도 포함할 수밖에 없었다. 물론 이러한 점은 대학원 과목의 독서자료로서 결함일 수도 있지만, 한편으로는 이로운 면으로도 작용할 수 있으리라고 생각된다. 특히 「한국과학사학회지」의 독자들 대부분이 과학사 전문교육을 받은 전문 과학사학자이기보다는 단순한 과학사 애호가들인 상황에서 이 자료들을 게재하는 데 있어서는 이같은 점이 크게 도움이 될 수도 있을 것이다.

1984 년 이 과목들이 처음 개설된 이래 독서자료의 내용은 점차적으로 바뀌어 왔다. 여기 실린 내용은 1989 년 1 학기와 1988 년 2 학기에 사용한 내용을 이번에 한차례 더 수정한 것이다. 처음부터 계속된 이와 같은 수정작업에는 이 과목들을 수강한 여러 학생들의 의견이 많이 반영되었음을 밝힌다.

II. 범 례

1. 각 주의 주제는 때에 따라 A, B, C 등의 소주제로 나뉘어져 있으며, 이들 소주제에 포함되지 않고 서두에 나와 있는 자료는 대체로 그 주의 주제 전체에 해당되는 개설적 내용이다.
2. 각 독서자료는 앞에 번호를 붙여서 구별했으며 번호를 통해 독서자료 간의 상호관계를 보여 주기도 했다. (예를 들어 2.10.1 과 2.10.2 는 서로 관련된 자료이며 2.9 와는 구별됨)
3. 번호에 괄호를 친 자료는 선택자료이고 그렇지 않은 것은 필수자료들이다. 선택자료는 그 주제 또는 소주제에 더 깊은 관심을 가진 학생을 위한 자료 또는 반드시 읽지는 않더라도 알고는 있어야 할 자료 등으로 되어 있다.
4. 6.1.1a 와 6.1.1b 처럼 같은 번호의 끝에 알파벳이 첨가되어 있는 것은 두가지 자료 중 한가지를 선택해야 하는 경우이다.
5. 약 어

DSB: Charles C. Gillispie, ed., *Dictionary of Scientific Biography* (New York: Scribners, 1970-1978)

HSPS: *Historical Structures in the Physical Sciences* (학술지)

BJHS: *British Journal for the History of Science* (학술지)

6. 자료중 상당수가 필자가 편집한 다음의 단행본들에 수록되어 있으며, 자료의 끝에 (역 1), (역 2)로 표시했다.

(역 1) 김영식 편, 역사 속의 과학 (창작과 비평사, 1982)

(역 2) 김영식 편, 근대사회와 과학—역사 속의 과학 II (창작과 비평사, 1989)

III. 자 료

과학사 통론 1

각 주별 주제

- 제 1 주 Introduction
- 제 2 주 과학의 시작 : “Pre-Socratics”
- 제 3 주 Platon 과 Aristoteles
- 제 4 주 Aristoteles 이후의 고대과학
- 제 5 주 중세의 과학
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- 제 8 주 역학의 혁명의 전개
- 제 9 주 과학혁명기의 생명과학
- 제10주 Bacon 과 Descartes: “New Philosophy”
- 제11주 과학단체와 새로운 과학활동 : 실험과학
- 제12주 과학혁명기의 과학과 사회 : 종교, 기술 등
- 제13주 Newton: 과학혁명의 완성과 그 영향

각 주별 독서과제

제 1 주 Introduction

- 1.1 T.S. Kuhn, *The Essential Tension*(Chicago, 1977), #1 (pp.3-20); 5(105-126); 6(127-161)
- 1.2 Arnold Thackray, "History of Science", in Paul T. Durbin, ed., *A Guide to the Culture of Science, Technology, and Medicine*(New York: Free Press, 1980), pp.3-69, (70-194)
- (1.3) S.G. Brush, "Should the History of Science Be Rated X?", *Science* 183(1974), 1164-1172.
- (1.4) Robert Young, "The Historiographic and Ideological Contexts of the Nineteenth-Century Debate on Man's Place in Nature", in M. Teich and R. Young, eds., *Changing Perspectives in the History of Science*(Boston: Reidel, 1973), pp.344-438.
- (1.5) Arnold Thackray and R.K. Merton, "On Discipline Building: The Paradoxes of George Sarton", *Isis* 63(1972), 473-495.
- (1.6) Steven Shapin, "History of Science and Its Sociological Reconstructions", *History of Science* 20(1982), 157-211.

과학사 전반에 관한 문헌

1. 책

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- Mason, Stephen F. *A History of the Sciences* (New York: Collier Books, 1962)
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- Kuhn, Thomas S., *The Structure of Scientific Revolutions* 2nd ed. (Chicago: Univ. of Chicago Pr., 1970)

2. 논문집

- Clagett, M. ed., *Critical Problems in the History of the Science* (Madison: Univ. of Wisconsin Pr., 1959)
- Crombie, A.C. ed., *Scientific Change* (New York: Basic Books, 1963)
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- Teich, Mikulas & Robert Young, eds., *Changing Perspectives in the History of Science; Essays in Honor of Joseph Needham* (Hingham, Mass.: Kluwer Boston, 1973)

3. 참고자료

- Gillispe, C.C., ed. *Dictionary of Scientific Biography* 16 vols.(New York: American Council of Learned Societies, Charles Scribner's Sons, 1970-80)
 Bynum, W.P. et al., *Dictionary of the History of Science*, (London: Macmillan, 1981)
Isis Cumulative Bibliography, 3 vols. (London: Marsell, 1971-76)
Isis Critical Bibliography (History of Science Society에서 매년 발간)

4. 학술잡지

1) 과학사 전반

Isis
 Osiris
 History of Science
 British Journal for the History of Science
 Annals of Science
 Archives Internationales d'Histoire des Sciences
 Centaurus
 Historia Scientiarum
 Studies in History and Philosophy of Sciences
 Science in Context

2) 분야사

Ambix
 Archive for History of Exact Sciences
 Historical Studies in the Physical and Biological Sciences
 Bulletin of History of Medicine
 Journal for the History of Astronomy
 Journal of the History of Biology
 Journal of History of Medicine & Allied Sciences

3) 과학사 관련 분야의 학술지

Science, Technology and Human Values
 Minerva
 Social Studies of Science
 Technology and Culture
 Science as Culture

4) 일반대중 상대의 잡지

Science
 Scientific American

5) 기 타

Journal of the History of Ideas
 American Historical Review

제 2 주 과학의 시작 : “Pre-Socratics”

- 2.1 G.E.R. Lloyd, *Early Greek Science* (New York, 1970), Chaps. 1-5(pp.1-65)
- A. 신화적 자연관
 - 2.2 Henri Frankfort, *et al.*, *Before Philosophy* (Chicago, 1946), Chaps. 1 (pp.11-36), 2(39-70), 5(137-199)
 - (2.3) G.S. Kirk, *Myth: Its Meaning and Functions in Ancient and Other Cultures* (Cambridge, 1970)
 - (2.4) Hesiod, *Theogony*
- B. 그리스 이전 고대 문화권의 과학
 - 2.5.1 O. Neugebauer, *The Exact Sciences in Antiquity*, second edn. (Brown U. Pr., 1957), Chaps. 2(pp.29-52), 4-5(71-144)
 - (2.5.2) Michael S. Mahoney, “Babylonian Algebra: Form vs. Content”, *Studies in History and Philosophy of Science* 1(1970), 369-380.
 - 2.6 H.E. Sigerist, *A History of Medicine*, vol. I (Oxford, 1951), pp.267-359.
 - (2.7) A.L. Oppenheim, “Man and Nature in Mesopotamian Civilization”, *DSB* 15 (1978), 634-666.
- C. 신화에서 과학으로
 - 2.8 Frankfort, *et al.*, *Before Philosophy* (2.2), Chap. 8(237-263)
 - 2.9 F.M. Cornford, *Principium Sapientiae*(Cambridge, 1952), esp. Chaps 1(3-11), 10-11 (159-201)
 - (2.10.1) D.J. Furley and R.E. Allen, eds., *Studies in Pre-Socratic Philosophy*, 2 volumes (New York, 1970, 1975)
 - (2.10.2) G.S. Kirk and J.E. Raven, *The Pre-Socratic Philosophers* (Cambridge, 1957)
 - (2.10.3) A.P.D. Mourelatos, ed., *The Pre-Socratics* (New York, 1974)
 - (2.10.4) John M. Robinson, *An Introduction to Early Greek Philosophy* (Boston, 1968)
 - (2.11) G.E.R. Lloyd, *Magic, Reason and Experience: Studies in the Origins and Development of Greek Science* (Cambridge U. Pr., 1979)
 - 2.12 M.R. Cohen and I.E. Drabkin, eds., *A Source Book in Greek Science* (Harvard U. Pr., 1948), pp.33-38, 41-44, 467-473, 488-494, 498-509.

제 3 주 Platon 과 Aristoteles

- 3.1 Lloyd, *Early Greek Science*(2.1), Chaps. 6-8(pp.66-124)
- A. Platon
 - 3.2 Plato, *Timaeus*: 가장 좋은 주해서는 F.M. Cornford, *Plato's Cosmology* (Indianapolis: Bobbs-Merrill, 1957)임
 - 3.3 Gregory Vlastos, *Plato's Universe* (Oxford U. Pr., 1975)
 - (3.4) Paul Friedländer, *Plato: An Introduction* (Princeton U. Pr., 1958), esp. Chap. 14.
- B. Aristoteles
 - 3.5 G.E.L. Owen, *et al.*, “Aristotle”, *DSB* 1(1970), 250-267.
 - 3.6 Aristotle, *Physics*, *On the Heavens*, *On the Parts of Animals* 등을 읽을 것. 특히

Physics, Bk. II, Bk III, Chaps. 1-3 과 *Parts of Animals*, Bk. I, Chaps. 1-3 과 *Parts of Animals*, Bk. I, Chaps. 1-5 를 읽을 것.

- 3.7 Cohen/Drabkin, *Source Book*(2.12), pp.97-105, 143-148, 200-212, 217-223, 415-424.
- (3.8.1) Marjorie Grene, *A Portrait of Aristotle* (U. Chicago Pr., 1963)
- (3.8.2) Friedrich Solmsen, *Aristotle's System of the Physical World*(Cornell U. Pr., 1960)
- (3.9.1) L.A. Kosman, "Aristotle's Definition of Motion", *Phronesis* 14(1969), 40-62.
- (3.9.2) Jonathan Barnes, M. Schofield and R. Sorabji, eds., *Articles on Aristotle*. Vol. I. *Science* (London: Duckworth, 1975), esp. #10.

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- 4.1.1 Lloyd, *Early Greek Science*(2.1), Chap. 9(pp.125-146)
- 4.1.2 Edward Grant, *Physical Science in the Middle Ages* (New York, 1971), Chap. 1 (1-12)
- A. Aristoteles 이후의 과학
 - 4.2 Lloyd, *Greek Science after Aristotle* (New York, 1973)
 - 4.3 Cohen and Drabkin, *Source Book*, pp.1-24, 38-57, 62-82, 105-130, 149-200, 223-255, 473-486, 521-529.
 - (4.4.1) Neugebauer, *Exact Science in Antiquity* (2.5.1), esp. Chap. 6(145-190), App. 1 (191-207)
 - (4.4.2) O. Pederson and M. Pihl, *Early Physics and Astronomy* (New York, 1974)
 - (4.4.3) T.L. Heath, *A History of Greek Mathematics* (Oxford, 1921)
 - (4.4.4) M.S. Mahoney, "Another Look at Greek Geometrical Analysis", *Archive for Hist. Exact Sci.* 5(1968), 318-348.
 - (4.5.1) Oswei Temkin, "Greek Medicine as Science and Craft", *Isis* 44(1953), 213-225.
 - (4.5.2) Leonard Wilson, "Erasistratus, Galen and the Pneuma", *Bull. Hist. Med.* 33(1959), 293-314.
 - (4.6) John P. Lynch, *Aristotle's School*(Berkeley, 1972)
- B. 고대과학의 쇠퇴
 - (4.7.1) S. Sambursky, *Physics of the Stoics* (London, 1959)
 - (4.7.2) Lucretius, *On the Nature of Things*
 - 4.8.1a Ludwig Edelstein, "Recent Trends in the Interpretation of Ancient Science", in Wiener and Noland, eds., *Roots of Scientific Thoughts*, 90-121.
 - 4.8.1b L. Edelstein, "Motives and Incentives for Science in Antiquity", in Crombie, ed., *Scientific Change*, 15-41 (역 1)
 - 4.8.2 Benjamin Farrington, *Greek Science*, 2 Parts (Baltimore: Penguin, 1944, 1949), esp. Part 1, Chap. 9, Part 2, Chap. 4.
 - (4.8.3) M.I. Finley, "Technological Innovation and Economic Progress in the Ancient World", *Economic History Review* 18 (1965), 29-45.
 - 4.9 D.C. Lindberg, "Science and the Early Christian Church", *Isis* 74(1983), 509-530.

C. 중세 초기 유럽의 과학과 기술

- 4.10 David C. Lindberg, ed., *Science in the Middle Ages* (U. Chicago Pr., 1978), Chap. 1(pp. 1-11, 23-51)
- 4.11 Edward Grant, ed., *A Source Book in Medieval Science* (Harvard U. Pr., 1974), pp. 3-24.
- (4.12) Lynn White, Jr., *Medieval Technology and Social Change* (Oxford, 1962)

제 5 주 중세의 과학

- 5.1 Grant, *Physical Science in the MA* (4.1.2), Chaps. 2-6 (pp. 13-90)

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- 5.2.1 Lindberg, *Science in MA*(4.10), Chap. 1(11-23), chap. 2(52-90)
- 5.2.2 J. Schacht and C.E Bosworth, eds., *The Legacy of Islam*, second edn., (Oxford, 1974), pp. 425-489.
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- (5.4) Charles H. Haskins, *The Renaissance of the Twelfth Century* (Harvard U. Pr., 1927), esp. Chaps. 9-11.

B. 중세과학의 배경

- 5.5 Lindberg, *Science in MA*(4.10), Chaps. 4(120-144), 14(461-482)
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- (5.7.2) John E. Murdoch and Edith D. Sylla, eds., *The Cultural Context of Medieval Learning* (Boston, 1975)

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- 5.8.1 Grant, *Source Book* (4.11), pp. 228-253, 275-306, 488-529, 547-554, 715-720, 729-739.
- (5.8.2) Marshall Clagett, *The Science of Mechanics in the Middle Ages*(U. Wisconsin Pr., 1961)
- 5.9 Lindberg, *Science in MA* (4.10), preface (vii-xv), Chaps. 5 (145-178), 7-9(206-337), 12(391-428)
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- (5.10.4.1) Anneliese Maier, *On the Threshold of Exact Science* (Philadelphia, 1982)
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제 6 주 과학혁명 : 총론 및 르네상스의 배경

A. 과학혁명 : 총론

- 6.1.1a Hugh Kearney, *Science and Change, 1500-1700* (London, 1971), introduction, Chaps. 1-5 (pp.7-186)
- 6.1.1b Allen G. Debus, *Man and Nature in the Renaissance* (Cambridge U. Pr., 1978)
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- (6.1.3) A Rupert Hall, *The Revolution in Science 1500-1750* (London: Longman, 1983)
- (6.1.4) 김영식, 과학혁명 : 근대과학의 출현과 그 배경 (민음사, 1984)
- (6.2) Theodore J. Rabb, *The Struggle for Stability in Early Modern Europe* (Oxford, 1975) esp. Chaps. 5-11(35-145)

B. Renaissance 의 과학

- 6.3.1 Paolo Rossi, *Philosophy, Technology and the Arts in the Early Modern Era* (New York, 1970), Chap. 1 (1-62)
- (6.3.2) C.D. O'Malley, *Andreas Vesalius of Brussels* (U. California Pr., 1964), Chaps. 7~8 (111-186), 특히 p.144 와 p.145 사이의 그림들
- (6.4) DSB article: Loenardo da Vinci
- (6.5) A. C. Crombie, "Science and the Arts in the Renaissance", *History of Science* 18 (1980), 233-246.
- 6.6.1 E. Grant, "Aristotelianism and the Longevity of the Medieval World View", *History of Science* 16(1978), 93-106.
- 6.6.2 Charles B. Schmitt, "Towards a Reassessment of Renaissance Aristotelianism", *History of Science* 11(1973), 159-193.
- (6.6.3) Schmitt, *Aristotle and the Renaissance* (Harvard U. Pr., 1983)
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과학사통론 2

각 주별 주제

제 1 주 Newton 과학과 계몽사조

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