A Brief History of the Group in Logic and the Methodology of Science

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The Creation of the Group in Logic





The Creation of the Group in Logic

To sell my merchandize [sic], I want to tell you more about the present situation of our field of research in the Bay area. As you know, Berkeley is now the unique place in the world which offers a Ph.D. degree in logic and methodology; in a sense logicians and methodologists (Henkin, Mates, Myhill, I, and a few other people) constitute now a separate unit in the University (denoted as a "group", not as a department); however, we all remain in our original departments. I expect that the majority of students working with Henkin or me will still get their degrees as regular mathematicians specializing in foundations; at the same time the way is open for those who wish to become full-blood [sic] logicians. We have this year several visiting people – Wanda Szmielew, Orey, Lightstone, Beth may come to the Philosophy Dp't for the spring term. (R. L. Vaught Papers, Bancroft Library, 1:32, November 2, 1957)



The Creation of the Group in Logic



If I get an appointment, my present salary will be available to the department and will be used to invite a "big shot" as a vis. professor; we are planning to invite Mostowski for 1958-59 or may be even for 3 terms, and van der Waerden will probably be here in the spring term. The same will apply to your salary if you accept my plan; we may then get Shepperdson [sic for Shepherdson] as replacement for you in 1958-59. It seems very likely that Dana Scott will be either here or at Stanford beginning next year. What a group! (R. L. Vaught Papers, Bancroft Library, 1:32)



19

Uprawnia do przejazdów państwowymi środkami komunikacyjnymi według ulg taryfowych dla **urzędników państwowych**

A. Tarski

19

19

Ważna na rok wystawienia. Ważność legitymacji przedłuża się na rok:

19

Iniwersytet Józefa Piłsudskiego Legitymacja Nr. 309/1 P. doc. dr. Torrski alfred adissort Seizier. Matematyps Wanawa, dr. 70. 8. 1939

z Rierownik. Sehrstarjain

Anderenin



Tarski to Woodger, November 4, 1942

Berkeley is a beautiful place – one of the most beautiful I saw in my life. It is so charming here that people don't seem to bother much about science. After all, life is so short, the weather so delightful (no summer, no winter), the ocean so immense, the hills so green, the eucalyptus trees so tall, – and mathematics is so hard a piece of work. Of course, there are exceptions. (Woodger Papers, Special Collections, UCL, London)



Tarski to Kurt and Adele Gödel

"The participants are exclusively professors and instructors of philosophy and mathematics; but the level is almost the same as in my other [undergraduate] classes" (December 1942, cited in Feferman and Feferman *Alfred Tarski. Life and Logic*, pp. 151-152).





Math department

Faculty in logic in the 1940s



Philosophy Dept.

1942:

Bernstein, R. Robinson, Tarski

Marhenke



1948: Bernstein, Kelley, R. Robinson, Tarski

Marhenke, Mates

führung des (nx)... " überhauft versichter und würde nur das Symbol , R'x" middels Axione von der folgenden (vereinfachten) Form einführe. (w): 2 Ry. =. w=x:. . x = R'y. Ernster ist die Frage der eventuellen Umfor

Remarks concerning the study of mathematical logic

It is my strong belief that the fundamental ideas of modern logic and methodology of deductive thinking should be regarded as an essential element of higher learning and be made available to the widest possible circle of students; furthermore, that students majoring in mathematics should be encouraged to take systematic courses in mathematical logic and foundations of mathematics so that they can bring to clarity in their minds the fundamental ideas and methods of argument involved in the major subject of their study; and finally that students working for a higher degree in mathematics should be given the opportunity to acquaint themselves with the important achievements of contemporary metamathematics and possibly to prepare themselves for research work in this field in case they become interested in it. (Remarks concerning the study of mathematical logic in the department of mathematics, 1947, Paul Marhenke Papers, Howison library)

(1) $A = \{\alpha, \beta^{n}\alpha\}$. Then (2) $A \subset E \times \& A \neq \Lambda$ [(2), Hp, 1.31] (3) $\bigcup \left(\delta \in A \& \bigcap_{\varepsilon, \varsigma} \left(\delta = \varepsilon^{n} \varsigma \rightarrow \varepsilon, \varsigma \notin A \right) \right)$ [1.6; (2)]

Offerings in logic (1942 - 1950)

12

1942 Mathematics

1942 Philosophy

Foundations of mathematics (127A-127B)

1948

Mathematical Logic (109A-109B)

1949

Seminar in metamathematics (225A-B)

1950 Set Theory (235A-B)

12, 113A-B, 213A-B



With kind permission of Karl Marhenke



Faculty in logic 1950s



Mathematics

1953: Henkin, Kelley, R. Robinson, Tarski

Mates, Kalicki

Philosophy

1954: Henkin, Kelley, R. Robinson, Tarski

Mates, Myhill





Offerings in logic in 1956-1957



Mathematics

125A-B (Mathematical Logic)
135A-B (Foundations of mathematics)
235A-B (Foundations of set Theory)
255A-B (Foundations of geometry)
Seminar on metamathematics (Henkin)
Seminar on Foundations of mathematics and abstract algebra (Tarski)
Philosophy
12A-B (Introduction to Logic)
113A (Intermediate Logic)
213A-B (Seminar in Logic)



(Some of) Tarski's Berkeley Ph.D.'s (1948-1957)

















NSF Grants and Areas Of Work (1955-1957)

- The main topics of investigations were indicated as:
- i. the general theory of models;
- ii. formalization and algebraization of logic;
- iii. foundations of set theory and models of set-theoretical axiom systems;
- iv. foundations of geometry;
- v. study of fundamental mathematical notions (consistency, completeness, decidability, and axiomatizability),
- vi. general theory of algebraic systems and study of special classes of algebras (lattices, Boolean algebras, semi-groups, and groups);
- vii. theory of relations.



The Foundations of the Group



August 13, 1956

Dean M. A. Stewart Acting Dean of the Graduate Division Administration Building

Dear Dean Stewart:

The undersigned hereby submit a proposal for offering the Fh.D. degree in a new field of study, to be entitled Logic and the Methodology of Science. We enclose a suggested list of requirements for this degree, and for purposes of comparison also the current lists of requirements for the Ph.D. in the Departments of Philosophy and Mathematics. Our motivation in making this proposal is as follows.

In recent years the University of California at Barkeley has become one of the most important centers of logical and methodological studies in the world. The prospect of doing advanced work in these fields under expert guidance has attracted students from all parts of the United States and even from Europe. If these students choose to work towards an advanced degree, however, they are forced to decide between two alternatives, neither of which is adequate for their purposes.



The Founders of the Group



Ernest Adams (Philosophy) Yuen Ren Chao (Linguistics and East Asian Languages) Leon Henkin (Mathematics) Victor F. Lenzen (Physics) Benson Mates (Philosophy) John Myhill (Philosophy) Raphael M. Robinson (Mathematics) Alfred Tarski (Mathematics)





PLEASE POST

– a new program of study for the Ph.D. degree

The University of California has instituted on its Berkeley campus what is believed to be a unique interdisciplinary program of study and research leading to the Ph.D. degree. Although the Department of Mathematics and the Department of Philosophy at Berkeley each offer a Ph.D. degree for which the student may prepare by writing a dissertation in logic, the new program is designed for those with a broad interest in logic and the methodology of science who wish to explore the subject in both its mathematical and philosophical aspects.

- FACULTY The program is administered by a group whose membership is drawn from several departments of the University. The present composition of this group is as follows: Ernest Adams, Ph.D., Assistant Professor of Philosophy; David Blackwell, Ph.D., Professor of Statistics; Yuen Ren Chao, Ph.D., Litt.D., Professor of Oriental Languages; Leon Henkin, Ph.D., Professor of Mathematics; Benson Mates, Ph.D., Professor of Philosophy; John R. Myhill, Ph.D., Associate Professor of Philosophy; Raphael M. Robinson, Ph.D., Professor of Mathematics; Alfred Tarski, Ph.D., Research Professor, Institute for Basic Research, and Professor of Mathematics (Chairman of the group); Robert Vaught, Ph.D., Assistant Professor of Mathematics.
- **ELIGIBILITY** In addition to satisfying the general requirements for admission to the Graduate Division of the University, a student desiring to enter this program shall have completed an undergraduate major in philosophy or in mathematics, or a joint major in both, including at least one full year upper division course in some science, and (b) at least one full year upper division course is some science, and (b) at least one full year upper division course in authematics (other than logic) if his undergraduate major was philosophy, or in philosophy (other than logic) if his undergraduate major was mathematics. A student who satisfies the requirements for admission to the Graduate Division, but who has not completed all of the above requirements for the program in Logic and Methodology, may in certain cases be permitted to enter the program of studies on the understanding that he will make up his entrance deficiencies.
- **REQUIREMENTS** In order to be formally advanced to candidacy for the Ph.D. degree in Logic and the Methodology of Science a student must complete the following requirements: (a) demonstrate a reading knowledge of two of the three languages, French, German, Russian; (b) demonstrate a detailed knowledge of the grammar of some language, ancient or modern; (c) exhibit evidence of his capacity to work independently, generally by completing two half-year seminars (one in mathematics and one in philosophy), in which he participates actively by presenting an oral exposition of assigned papers and topics; and (d) pass an oral examination involving three subjects in each of the following two groups: I. Theory of Probability, Algebra, Mathematical Logic and Metamathematics, Theory of Functions of a Real Variable, Set Theory and Point Set Topology, Mechanics; II. Methodology of Empirical Science, Semantics and the Philosophy of Language, Theory of Knowledge, Many-valued, Modal, and Intuitionistic Systems of Logic, Philosophy of Mathematics, History of Logic. These requirements comprise approximately one half of the corresponding requirements in each of the Departments of Mathematics and Philosophy. After advancement to candidacy the student must write an acceptable dissertation and pass a final oral examination in order to earn the degree.
- **TEACHING ASSISTANTSHIPS** Several assistantships and associateships are available in the Departments of Mathematics and Philosophy to students working in this program. These positions pay \$1,520 and \$2,490, respectively, for two semesters of work (which generally involves teaching 6 hours per week). Application forms for these positions should be obtained from and filed with the department for whose teaching duties the student feels himself best qualified. The forms must be filed by February 15, and should be clearly marked "Logic and Methodology Program" at the top of the first page.
- **INFORMATION** A catalogue of courses is available from the Registrar for 25 cents. A bulletin giving entrance requirements and describing general requirements for higher degrees may be secured from the Graduate Division. Particular questions concerning the new program should be addressed to Professor Leon Henkin, Department of Mathematics, University of California, Berkeley 4, California.
- **APPLICATION** forms for admission to graduate study should be obtained from the Graduate Division and must be returned by July 15.



Sixty years: Faculty



The boom in faculty hiring of the 1960s also reflected itself in the growing size of the faculty in the Group. In 1959 Lenzen was no longer in the roster but Blackwell and Vaught were added. In September 1960 Myhill was gone but Dana Scott entered the list. Craig joined in 1961, Addison in 1963, and Enderton and Harsanyi (the one member of the Group awarded the Nobel Prize) in 1965. In 1966 Chihara, Solovay, and Dubins were added. By 1967 the Group had 15 active faculty members. A total of 60 faculty members have been members of the Group



since its inception.





Sixty years: Students



During its sixty years of life the Group has awarded 82 Ph.D.'s. A major concern in the initial days of the Group was to insure that the quality of the students was of high caliber. In May 1966 a progress report stated:

"The Group has continued to raise its admission standards and they are now such that only students of fellowship caliber have been admitted for the next quarter. The caliber of students now in the program appears to be well above the average of graduate students in the Departments of Mathematics and Philosophy."



Sixty years: Students

In a memo (dated August 5, 1968) to Dean Hammel, who was worried that the large number of students working in foundations (75 in the department of mathematics!) might indicate low standards of admission, Graduate Adviser John Addison explained that the Logic Group had very high standards of admission: "The Group in Logic and the Methodology of Science controls only admissions to the Group and has no control over students admitted to the Department of Mathematics or to the Department of Philosophy. If you will study the record of admissions decision by the Group I expect that you will find our standards among the very highest in the university." How was this achieved?



Sixty years: Students

Addison continued:

"We first discourage weak students by a statement in our Announcement. Then of those who write enquiries we often write further discouraging words. Finally, of those who apply we admit what I would guess to be a lower percentage than is common in other departments. For example, we turned down a Woodrow Wilson Fellow last year because we felt he was not able enough." (Group in L&M, Chair files)



Giorgio de Chirico, La nostalgie de l'infini,1913

That's all, folks!