Alan W. Bishop
1920–1988

Professor Alan Bishop died suddenly at his home in Whitstable, on 30 June 1988, while recovering from major cardiac surgery. He will be remembered especially for his work on embankment dams and for his flair in instrument design which enabled him to become perhaps the foremost experimentalist of his time.

Alan Wilfred Bishop was born at Whitstable on 27 May 1920. He was educated at King's College School, Wimbledon, and at the University of Cambridge, where he was a senior scholar at Emmanuel College and took the Mechanical Sciences Tripos in 1942. His first appointment was as an engineer with the Metropolitan Water Board. At that time, the designs for the Walton Reservoir were being reassessed in the light of the experience gained from studies into the causes of failure of the Chingford dam. These studies were conducted at the Building Research Station, and Alan Bishop was seconded to work there with the soils group. While at the BRS, he designed and built his own equipment for testing foundation soils, and for taking soil samples. This early work typified the approach used by Bishop, in that he always insisted that the best possible soil test data should be used in any analysis. If the apparatus available could not give the quality of data he required then he simply devised and built equipment that would. Usually the apparatus produced was so much better than that currently available that the commercial manufacturers switched to his designs.

Alan Bishop was equally at home with analytical studies and, combining this with his practical ability, he was the obvious choice as the first member of the soils team Professor Skempton set up at Imperial College. Bishop moved to take up an appointment as an assistant lecturer in October 1946. At Imperial College he continued to design and develop new soils test and sampling equipment, but now the equipment was used to study fundamental properties of soil behaviour as well as to obtain results required for engineering problems. Theory and practice, welded together by continually checking one against the other: this was the formula used so successfully by Bishop.

Academic distinctions followed—promoted to lecturer in 1947, PhD in 1952, Reader and DSc in 1957, Professor of Soil Mechanics in 1965. Honours were also conferred by the profession in recognition of his contributions. Premiums and prizes were awarded by the Institution of Civil Engineers and the British Geotechnical Society.

Alan Bishop's first experience in soil mechanics was with earth retaining structures, and he used this branch of study as a vehicle for his research work.

Because of his deep understanding of soil behaviour, Bishop was always in demand and his advice was sought by many firms of consulting engineers. He was also asked to investigate the causes of engineering failures, perhaps the most notable being that of Aberfan in October 1966. Bishop led the team of investigators at the tribunal and the outcome was to have a profound effect on the mining industry in terms of the statutory provisions with regard to safety.

Alan Bishop was an international figure and regularly travelled abroad to lecture. Bishop's public lectures were notable in that they were always crowded. Two halls were needed for his Rankine Lecture in 1966 on 'The strength of soils as engineering materials'; engineers coming from far and wide. All of his lectures were invariably packed with interest and incisive comment and it paid to be early in the lecture hall so as to secure a seat close to the front, because this famous man was intensely shy and spoke very softly.

Imperial College was fortunate when Professor Skempton asked Alan Bishop to join the staff, not only because of the reasons highlighted above, but because he took a great interest in the development of the soils section and in the welfare of the staff and students. He was Dean of the City and Guilds College for three years from 1970 to 1973.

Alan was a keen sailor, and kept a converted lifeboat at Faversham. When time permitted, he would sail in the Thames estuary and up-river, his crew recruited from the current group of research students.

Unfortunately, Alan Bishop was not blessed with robust health and he had to retire in 1980. After this time he became a Senior Research Fellow from 1980 to 1983 and the title of Emeritus Professor was conferred. Single throughout his college life, Alan was now fortunate to meet and marry Myrtle. Myrtle and Alan embarked on a new life which was spent in Scotland during the spring and summer, returning to their home in Whitstable for the winter. These last five years were short but happy ones.

Angus Skinner

Professor A. W. Skempton adds:

'It was a great privilege and the best of good fortune to be associated for nearly 40 years with one of the finest intellects in our subject. In no respect was his intellectual power seen more clearly than in his continued study of Terzaghi's principle of effective stress and its application in all branches of geotechnical engineering; his work in this field brought about a highly beneficial revolution in soil mechanics.

As for his skill as an experimentalist, Albert Caquot, the distinguished French academician, exclaimed after a visit to the laboratory at Imperial College, 'this is the country of Michael Faraday'. Bishop was totally and very seriously devoted to soil mechanics, both as a scientist and an engineer.

Though reserved in a manner compatible with his Quaker faith, he appreciated a good sense of humour. He was loved and respected by his numerous research students, who came from all parts of the world. Through them and the strict but friendly criticism of his colleagues' work, and his own important contributions, he exerted a unique influence.'

BIBLIOGRAPHY

1946. The leakage of a clay core-wall. *Trans. Inst. Water Engrs* **51**, 97–116.
1948. Part III—Strength variations in London Clay. *Silicates Industriels* **13**, No. 9, 109–113.
1948. A large shear box for testing sands and gravels. *Proc. 2nd Int. Conf. Soil Mech.* **1**, 207–211.
1948. Some factors involved in the design of a large earth dam in the Thames valley. *Proc. 2nd Int. Conf. Soil Mech.* **2**, 13–18.
1948. Driving and loading tests on six precast concrete piles in gravel. *Géotechnique* **1**, 49–58. Co-authors: V. H. Collingridge & T. P. O'Sullivan.
1948. A new sampling tool for use in cohesionless sands below ground water level. *Géotechnique* **1**, 125–131.
1950. Undrained triaxial tests on saturated sands and their significance in the general theory of shear strength. *Géotechnique* **2**, 13–32. Co-author: A. K. G. Eldin.
1950. The measurement of the shear strength of soils. *Géotechnique* **2**, 90–108. Co-author: A. W. Skempton.
1953. The effect of stress history on the relation between ϕ and porosity in sand. *Proc. 3rd Int. Conf. Soil Mech.* **1**, 100–105. Co-author: A. K. G. Eldin.
1953. Pore pressure changes during shear in two undisturbed clays. *Proc. 3rd Int. Conf. Soil Mech.* **1**, 94–99. Co-author: D. J. Henkel.
1953. A constant pressure control for the triaxial compression test. *Géotechnique* **3**, 339–344. Co-author: D. J. Henkel.
1954. Soils. *Building materials: their elasticity and inelasticity.* (Ed. M. Reiner). North Holland Publishing, 417–482.
1954. Correspondence. *Géotechnique* **4**, 43–45.
1954. The use of slip circle in the stability analysis of slopes. *Proc. Euro. Conf. Stability of Earth Slopes* **1**, 1–13.
1954. The use of pore pressure coefficients in practice. *Géotechnique* **4**, 148–152.
1955. The gain in stability due to pore pressure dissipation in a soft clay foundation. *Proc. 5th Cong. Large Dams* **1**, 613–638. Co-author: A. W. Skempton.
1957. Earth pressure and the design of earth retaining structures. *The analysis of engineering structures* (A. J. S. Pippard & J. F. Baker.) Edward Arnold, 490–514.
1957. Some factors controlling the pore pressures set up during the construction of earth dams. *Proc. 4th Int. Conf. Soil Mech.* **2**, 294–300.
1957. Embankment dams: principles of design and stability analysis. *Hydro-electric engineering practice* (Ed. J. Guthrie-Brown). Blackie, 349–406.
1957. *The measurement of soil properties in the triaxial test.* Edward Arnold. Co-author: D. J. Henkel.
1962. *The measurement of soil properties in the triaxial test.* (2nd Edn) Edward Arnold. Co-author: D. J. Henkel.
1958. Test requirements for measuring the coefficient of earth pressure at rest. *Proc. Conf. Earth Pressure Problems, Brussels* **1**, 2–14.
1959 The principle of effective stress. *Teknisk Ukeblad* **106**, 859–863.
1960. Stability coefficients for earth slopes. *Géotechnique* **10**, 129–150. Co-author: N. Morgenstern.
1961. The measurement of pore pressure in the triaxial test. *Proc. Conf. Pore Pressure and Suction in Soils.* Butterworth, 38–46.
1961. Pore pressure observations at Selset Dam. *Proc. Conf. Pore Pressure and Suction in Soils.* Butterworth, 91–102. Co-authors: M. F. Kennard & A. D. M. Penman.
1960. The relevance of the triaxial test to the solution of stability problems. *Proc. Res. Conf. Shear Strength of Cohesive Soils*, 437–501. Co-author: L. Bjerrum.
1960. Factors controlling the strength of partly saturated cohesive soils. *Proc. Res. Conf. Shear Strength of Cohesive Soils*, 503–532. Co-authors: I. Alpan, G. E. Blight & I. B. Donald.
1960. Discussion. *Proc. Res. Conf. Shear Strength of*

Cohesive Soils, 1027–1042. Co-authors: G. E. Blight & I. B. Donald.

1961. The experimental study of partly saturated soil in the triaxial apparatus. *Proc. 5th Int. Conf. Soil Mech.* **1**, 13–21. Co-author: I. B. Donald.

1962. Selset Reservoir: design and performance of the embankment. *Proc. Inst. Civ. Engrs* **21**, 305–346. Co-author: P. R. Vaughan.

1962. Discussion. *Proc. Inst. Civ. Engrs* **23**, 726–765. Co-author: P. R. Vaughan.

1963. The development of uplift pressures downstream of a grouted cut-off during the impounding of Selset Reservoir. *Proc. Conf. Grouts and Drilling Muds in Engineering Practice*, 98–104. Co-authors: M. F. Kennard & P. R. Vaughan.

1963. Some aspects of effective stress in saturated and partly saturated soils. *Géotechnique* **13**, 177–197. Co-author: G. E. Blight.

1963. General report on compressibility of soils, stress–strain properties and pore pressure prediction. *Proc. Euro. Conf. Soil Mech.* **2**, 7–11.

1963. The influence of the provisions for boundary drainage on strength and consolidation characteristics measured in the triaxial test. *Conf. Shear Testing of Soils, Ottawa*, Spec. Tech. Publn 361, Am. Soc. Civ. Engrs, 435–451. Co-author: R. E. Gibson.

1964. Developments in the measurement and interpretation of pore pressure in earth dams. *Proc. 8th Cong. Large Dams* **2**, 47–72. Co-authors: P. R. Vaughan & M. F. Kennard.

1965. Undisturbed samples of London clay from the Ashford Common Shaft: strength-effective stress relationships. *Géotechnique* **15**, 1–31. Co-authors: D. L. Webb & P. I. Lewin.

1965. The influence of end restraint on the compression strength of a cohesionless soil. *Géotechnique* **15**, 243–266. Co-author: G. E. Green.

1965. Triaxial tests on soil at elevated cell pressures. *Proc. 6th Int. Conf. Soil Mech.* **1**, 170–174. Co-authors: D. L. Webb & A. E. Skinner.

1965. Discussion. *Proc. 6th Int. Conf. Soil Mech.* **3**, 306–310.

1966. The strength of soils as engineering materials. 6th Rankine Lecture. *Géotechnique* **16**, 89–130.

1966. Soils and soft rocks as engineering materials. *Inaugural Lectures, Imperial College, 1964–1966*, 289–313.

1967. Progressive failure—with special reference to the mechanism causing it. Discussion. *Geotech. Conf., Oslo* **2**, 142–150.

1967. The influence of the size and orientation of the sample on the apparent strength of the London clay at Maldon, Essex. *Proc. Geotech. Conf., Oslo* **1**, 89–96. Co-author: A. L. Little.

1969. Geotechnical investigation into the causes and circumstances of the disaster of 21st October 1966. *A selection of technical reports submitted to the Aberfan Tribunal.* HMSO, 1–80. Co-authors: J. N. Hutchinson, A. D. M. Penman & H. E. Evans.

1969. A note on the drained strength of sand under generalized strain conditions. *Géotechnique* **19**, 144–149. Co-author: G. E. Green.

1969. Drained tension tests on London clay. *Géotechnique* **19**, 309–313. Co-author: V. K. Garga.

1969. Some comparisons between laboratory tests, in situ tests and full-scale performance, with special reference to permeability and coefficient of consolidation. *Proc. Conf. In Situ Investigations in Soils and Rocks*, 251–264. Co-author: Z. A. Al-Dhahir.

1969. Creep characteristics of two undisturbed clays. *Proc. 7th Int. Conf. Soil Mech.* **1**, 29–37. Co-author: H. T. Lovenbury.

1969. Pore pressure measurements in the field and in the laboratory. *Proc. 7th Int. Conf. Soil Mech.* **3**, 427–444. Co-authors: P. R. Vaughan & G. E. Green.

1969. Discussion. *Proc. 7th Int. Conf. Soil Mech.* **3**, 182–186.

1971. Shear strength parameters for undisturbed and remoulded soil specimens. *Stress–strain behaviour of soils.* Proc. Roscoe Memorial Symp., Cambridge 3–139.

1971. The influence of progressive failure on the choice of the method of stability analysis. *Géotechnique* **21**, 168–172.

1971. Discussion. *Proc. Conf. Behaviour of Piles*, 31–33.

1971. Discussion on Derwent Dam: Papers 7263–7265. *Proc. Inst. Civ. Engrs* **48**, 500–507.

1971. A new ring shear apparatus and its application to the measurement of residual strength. *Géotechnique* **21**, 273–328. Co-authors: G. E. Green, V. K. Garga, A. Andresen & J. D. Brown.

1972. *Consolidation of fine-grained dredged material after hydraulic deposition.* National Ports Council. Co-author: P. R. Vaughan.

1973. Strength and deformation measurements of soils. *Proc. 8th Int. Conf. Soil Mech., Moscow* **1**, 57–64. Co-authors: G. E. Green & A. E. Skinner.

1973. The development and use of trial embankments. Symp. Field Instrumentation, *Geotech. Engng* **1**, 13–37. Co-author: P. A. Green.

1973. The influence of an undrained change in stress on the pore pressure in porous media of low compressibility. *Géotechnique* **23**, 435–442.

1973. The stability of tips and spoil heaps. *Q. J. Engng Geol.* **6**, 335–376.

1974. The strength of crustal materials. *Q. J. Engng Geol.* **8**, 139–153.

1975. The influence of pore-water tension on the strength of clay. *Phil. Trans. Royal Soc., London* **A**, 278, 511–554. Co-authors: N. K. Kumapley & A. El-Ruwayih.

1975. A hydraulic triaxial apparatus for controlled stress path testing. *Géotechnique* **25**, 657–670. Co-author: L. D. Wesley.

1976. The influence of system compressibility on the observed pore-pressure response to an undrained change in stress in saturated rock. *Géotechnique* **26**, 371–375.

1977. The value of Poisson's ratio in saturated soils and rocks stressed under undrained conditions. *Géotechnique* **27**, 369–384. Co-author: D. W. Hight.

1977. The influence of high pore-water pressure on the strength of cohesionless soils. *Phil. Trans. Royal Soc., London* **A**, 284, 91–130. Co-author: A. E. Skinner.

1981. Thirty-five years of soil testing. *Proc. 10th Int. Conf. Soil Mech., Stockholm* **4**, 185–193.