Arthur Bleksley: pioneer of science awareness in South Africa

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On astronomy

It is work that does not bring dividends, but for those of us who look beyond material values and want to know about the Universe, who feel the mystery of life and to whom Nature makes a profound appeal, it is of more value than all the diamonds of Kimberley and all the gold of Johannesburg.

Jan Christiaan Smuts, at a meeting of the Astronomical Society of South Africa, 8 February 1933.

Arthur Bleksley was born one hundred years ago, in 1908. In his early career, he undertook research in astrophysics and astronomy on variable stars. He was an outstanding university teacher of applied mathematics. He pioneered science awareness in South Africa through his scientific articles in the press, his radio broadcasts and his presentations at the Johannesburg Planetarium. An outline of Bleksley's life and career is given together with his contribution to research, teaching and science awareness.

Introduction

The year 2008 marks the centenary of the birth of Arthur Bleksley. In the 1930s, Bleksley undertook research in astrophysics, and subsequently became respected by generations of South African scientists and engineers as an outstanding teacher of applied mathematics. The general public knew him as 'Mr Science' because of his ability to explain complicated scientific concepts in language that the layperson could understand.

In the early days, Bleksley was something of an embarrassment to his fellow scientists who disapproved of his popular scientific articles in the press and his scientific talks on radio,[1] but during his lifetime there developed a complete change in attitude to science awareness worldwide. I review Bleksley's life and work and assess the contribution he made to research, teaching and science awareness in South Africa. Figure 1 shows the man in mid-career.

A short biography of Bleksley appeared in the *Gazette* of the University of the Witwatersrand (Wits)[1] on his retirement in 1968. Short biographies have also been written by Burnton[2] and Murray.[3] The accompanying box sketches important events in his life and career.

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Fig. 1. Bleksley in mid-career.

Research and publications

Bleksley was the sole author in all 50 of the papers listed in the bibliography. He worked on his own, which was not unusual for that time. A thorough bibliography of published articles, books and certain radio scripts in Bleksley's library covering the period 1929 to 1969 was compiled by Burnton[2] in 1970.

Bleksley's contribution to research was made mainly in the 1930s and in the area of astrophysics. He undertook a detailed statistical and analytical investigation of variable stars. He developed a mathematical model, largely due to Eddington,[5] of radially pulsating stars, and compared the predictions of the model with observations for the Cepheid variable stars and the long-period variable stars such as the Mira variables. In his first paper on astrophysics [A1 in accompanying bibliography], he showed, using dimensional analysis, that any pulsating star independent of its constitution must satisfy a period-density law of the kind derived by Eddington. He made the assumption that the radiation from the Cepheid variables is black-body radiation and derived a relation between the temperature and the radius in these stars [A8, 15, 16, 18,19]. He studied relations between the period, luminosity and spectrum of the Cepheid and long-period variable stars [A22]. Later he performed a similar study of relations between their mass, luminosity and temperature [A26]. Bleksley also studied the oscillations of the atmosphere of a pulsating star and showed that the radial velocity of the atmosphere will differ in phase from that of the photosphere in a way that agrees with observations [A23]. A theory of the origin of the emission lines in the spectra of long-period variable stars was developed based on the theory of pulsations of the stellar atmospheres.

Bleksley also studied binary stars. He clarified a difficulty in the problem of the variation in the orbital elements of a binary star when one or both of the components is losing mass by radiation [A7, 13]. He also undertook a statistical study of the mass, density and radius of some eclipsing binary stars [A25].

Many of the papers published by Bleksley up to 1937 formed the basis of his doctoral thesis, much of which was published in the *South African Journal of Science* [A23]. Paper [A24] is a report on the research Bleksley conducted during his stay at Leiden Observatory in 1938 on the period and light curve of an Algol star discovered to be variable on plates taken at Johannesburg. Bleksley had three Letters to the Editor accepted by *Nature* [A7, 8, 11], summarizing new results, the full derivation of which he published later either in *Zeitschrift für Astrophysik* [A13, 16] or *Astronomische Nachrichten* [A18].

Bleksley published one paper on geometry [M1], which was based on his M.Sc. dissertation, and two statistical papers with geometrical interpretation [M2, 3]. Throughout the 1940s, he was interested in nuclear energy [N1–4], possibly due to its application in astrophysics [N5]. At the end of the 1940s and the beginning of the 1950s, he worked on quantum mechanics [Q1, 2] and cosmology [C1–4], and in the mid-1950s he developed an interest in solar energy. The knowledge of solar radiation that he acquired at the solar observatory in 1931 would have been useful. In 1954 he attended a conference on solar energy organized by UNESCO in India, and in July 1955 read a paper at the Grahamstown Congress of S_2A_3 on the problems of collection, use and storage of solar energy [S1]. In November 1955 he delivered a paper at a world symposium on applied solar energy at Phoenix, Arizona, and published a full report on

BIOGRAPHICAL SKETCH

27 April 1908 Birth of Arthur Edward Herbert Bleksley in Matatiele in East Griqualand (now South Africa's Freedom Day). Inaugural meeting of the first Council of the Royal Society of South Africa.

Schooldays Son of a postmaster, the young Bleksley completed Standard 8 in Steytlerville in the Karoo. He retained affection for the region, saying later that the only other place he might have enjoyed living in was Arizona, as it reminded him of where he grew up. He never felt at home in England although his forebears were British.

On his father's retirement, the family moved to George. There Bleksley developed his love of the stars, read avidly, and slept outside in a tent so as to admire the night sky. At school in George he met his future wife, Lilian Fourie, and built his own first radio.

1925 On his father's advice, Bleksley entered the University of Stellenbosch, where he studied mathematics and physics as majors, read widely, became fluent in Afrikaans, and even studied Greek and Hebrew.

1927 Bleksley obtained his B.Sc. degree *cum laude*.

1928 Obtained his M.Sc. degree *cum laude* in mathematics and physics; received the van der Horst Prize.

1929–1930 The Union Postgraduate Fellowship for fürther study and research enabled Bleksley to conduct research in astrophysics on variable stars at the universities of Stellenbosch and Cape Town. He worked under J.K.E. Halm, formerly chief assistant at the Royal Observatory in Cape Town.[2] In 1929, he became an assistant in the Department of Mathematics at the University of Stellenbosch, and in 1930 a temporary lecturer in the Department of Applied Mathematics at the University of Cape Town.

1931 Bleksley was a research associate in the Smithsonian Institution's Solar Observatory at Mount Brukkaros, the caldera of an extinct volcano, near Keetmanshoop, Namibia (then South West Africa). The observatory, comprising a 10-m-deep tunnel in the side of the mountain with a solar telescope at its entrance, was one of several observatories established at high altitude locations to collect solar radiation data, to investigate a correlation with the Earth's weather. (It closed in December 1931 and was moved to the Sinai peninsula.) On 1 September, Bleksley joined Wits as a junior lecturer in the Department of Applied Mathematics and Astronomy (see Fig. A in supplementary material online). Here he remained for the next 37 years.

Shortly after joining the department, he began his 53 years of happy married life with Lilian Fourie. They had one daughter, Rosaline Nassar—a medical doctor and Wits graduate—and two grandchildren, Danielle and Dominic.

6 August 1937 Bleksley obtained his D.Sc. degree at Wits. At his wife's insistence, he had submitted his thesis entitled 'The pulsation variables: an analytical and statistical study of stellar variability'. The three external examiners were Halm, under whom Bleksley had worked when he held the Union Postgraduate Fellowship; Harlow Shapley, who first proposed the pulsation theory to explain regular stellar variability; and Sir Arthur Eddington, who developed the theory mathematically.

At the Wits garden party after his graduation, Bleksley met Phillip Burger of the SABC, who had just received his master's degree and who invited Bleksley to write a series of talks on astronomy for the Afrikaans children's programme. These were well received. Bleksley was then asked to write more talks, and in this way his work in broadcasting began.

1938 Bleksley was granted sabbatical leave and travelled abroad to continue research in astrophysics. He visited the University of Cambridge (U.K.) to work with Eddington; Leiden Observatory (the Netherlands) to work with Ejnar Hertzsprung; and the University of Göttingen (Germany) to work with Hans Kienle.

1940 Bleksley was promoted to senior lecturer. Wits also awarded him the H.B. Webb Fellowship for 1940, but World War II prevented him from taking it up. He served in the infantry sub-unit of the Rand University Training Corps, and put his knowledge of astronomy to practical use by designing a universal sun compass, which was accepted by the Union Defence Force and proved valuable in the desert war in North Africa.

1942 Bleksley was appointed to the Council of the South African Association for the Advancement of Science (S_2A_3), with which he had a long and active relationship. He became president of Section A in 1943, and honorary general secretary in **1948**, a position he held for the next 25 years.

In the years following World War II, student numbers at Wits nearly doubled in the challenge of providing university education for ex-volunteers, and ex-servicemen and women. In faculties such as Science and Engineering, first-year courses were duplicated and laboratory classes extended into the night. Like all other members of staff, Bleksley devoted much of his time during this period to teaching.

1949–1950 He served as president of the Astronomical Society of South Africa for 1949–50.

As Rubbi Lecturer at the University of Stellenbosch for 1949, he gave an address entitled 'Groepe-teorie en Atoomstruktuur', which was later published.

1951–1956 In August 1951, on Herbert Le May's retirement as professor of applied mathematics and head of the Department of Applied Mathematics and Astronomy, Bleksley was appointed acting-head. Murray[3] has described the procedure leading to the filling of the chair. The first advertisement sought applicants with 'research interests in Theoretical or Mathematical Physics who will be able to assist in the higher training of physicists'. The selection committee recommended the appointment of a Canadian with a good research record but little teaching experience. The Senate, concerned about undergraduate teaching, referred the appointment back to the selection committee. The chair was re-advertised without specification of research interest and, on 1 February 1953, Bleksley became chair of Applied Mathematics and head of department, positions he held for the next 15 years. He delivered his inaugural lecture, 'The problems of cosmology', on 4 April 1956.

1958–1960 As president of S_2A_3 (July 1957–July 1958), he delivered the Presidential Address, 'Science and society', at the association's annual congress in Lourenço Marques (now Maputo) in 1958. In the same year he founded the Science Writers Association of South Africa and was elected its first president. He was a member of the Faculty of Science of the Suid-Afrikaanse Akademie vir Wetenskap en Kuns and, in 1960, recognizing his scientific achievements, the Royal Society of South Africa elected him a Fellow. Also in 1960, Bleksley was appointed director of the Johannesburg Planetarium. He was the main person responsible for the establishment of the Zeiss Planetarium and for its purchase by Wits.

1964 Bleksley's interest in parapsychology won him the Eighth McDougall award for research in the subject. The award (made by Duke University, North Carolina, USA, for the most outstanding paper on extra-sensory perception during the preceding year) was worth US$1 000. His paper (listed in the bibliography as [P1]), dealt with an investigation on making a person in Cape Town waken at times set by an alarm clock in Johannesburg.

1968 In August, Bleksley retired as director of the Planetarium (see Fig. B online) and, on 31 December, from the chair of Applied Mathematics and the headship of the Department of Applied Mathematics and Astronomy (see Fig. C online). He took with him the name plate on his office door and attached it to the door of his study in his Parkview home. Thereafter, he visited the department only when invited.

Retirement His was an active retirement. He continued with his radio work and in 1977 received the Artes Award for Best Broadcaster (see Fig. D online). After a stroke in that year, he continued writing the radio programmes for a few weeks even though his voice was no longer heard on air.

July 1984 On 8 July, he was rushed to hospital suffering from an aneurysm. He died peacefully at 08:15 the next morning, 9 July 1984, aged 76. He was survived by his wife, daughter, and grandchildren.

the conference [S2]. By the end of the 1950s, the electronic computer had become available for research. Bleksley gave an analysis of the use of a computer to forecast the results of the South African general election of 1958 and the Republican Referendum of 1960, after the first few results had been received [G4, 5].

A significant feature of Bleksley's research in astrophysics was the checking of theory against observations and he developed a good working knowledge of statistics. His other publications were mainly reviews, some presidential addresses, which pointed the way to important areas of research. Statements were generally supported quantitatively with numerical data. Bleksley recognized early new areas of investigation that would become significant in the future—nuclear and solar energy, interplanetary space travel, a unified theory of cosmology and quantum mechanics, and the computer prediction of election results.

Teacher

Bleksley believed that a teacher's job is to open doors, on the basis that the more doors you can see the more you can open. He did not become totally specialized and tried to retain a broader approach to applied mathematics. He saw the teacher as a link to the narrow specialist, not knowing as much as the specialist but knowing more than the non-specialist. His department was responsible for lecturing applied mathematics to students in the faculties of Science and Engineering, and, over the years, Bleksley taught most of the courses it offered. He taught mechanics to generations of engineering graduates, many of whom later held important positions in industry, in South Africa and abroad.

Bleksley wrote two textbooks on mechanics, which went through several editions and were widely used in South African universities. The second volume contained chapters on the equilibrium and motion of fluids and on oscillations of continuous systems. His textbooks contain many worked examples and they list exercises for the student at the end of each chapter. It is generally recognized that his books contributed significantly in placing the teaching of mechanics in South Africa on a sound basis.

Bleksley did not teach from notes. His lectures were models of clarity, and he used simple language even when explaining the most difficult concepts. Students enjoyed the pleasant, relaxed atmosphere in his classes, his sense of humour, and the fact that he never got angry, and they found him very approachable despite his many other responsibilities. Anthony Starfield, Bleksley's student in the 1960s and his successor as professor of applied mathematics, comments (pers. comm.):[15]

> He was the best of teachers and the worst of teachers – best because he was so crystal clear, worst because he made everything sound so logical and simple that most students assumed they had mastered the material just by listening to him. It worked for good students, but was fatal for weaker students.

Bleksley found that, while universities in South Africa had changed, the students had not: 'Students still have the same ideals. They still want to work and achieve the rewards.' He was honorary president of many student societies.

Planetarium

The Johannesburg Planetarium was the first full-sized planetarium in Africa and the second in the southern hemisphere. Bleksley [G5] described the events leading to the establishment of the Johannesburg Planetarium at Wits in 1960 and its purchase from the City of Hamburg in Germany by the City of Johannesburg to mark the 70th anniversary of the founding of Johannesburg.

During his years as director of the Planetarium (1960–68), Bleksley gave 2000 lectures there. At that time of active space exploration, he informed the citizens of Johannesburg about the significance of the events taking place. A special function was organized by S_2A_3 at the Planetarium, attended by about 100 guests, to mark Bleksley's last lecture as director on 19 August 1968. Before the start of the lecture, Raymond Dart presented Bleksley with a scroll commemorating eight years as director and 20 years as secretary of S_2A_3, and praised him for carrying 'this university [University of the Witwatersrand] into the city'. Later in the year, the Wits vice-chancellor and principal, Professor I.D. MacCrone, wrote to Bleksley on his retirement to convey the university council's gratitude for bringing the Planetarium into being, for ensuring its success as an educational amenity for the citizens of Johannesburg and their children, and for his guidance as director (Fig. C online).

Radio broadcasting

In the early days of broadcasting, some academic colleagues felt it unprofessional for a professor to give radio talks. They thought he was letting the side down by going into the marketplace and talking to the people. Bleksley firmly believed, however, that not only were people entitled to know what scientists were thinking, but they also desperately wanted to know.

The successful talks on astronomy for the Afrikaans children's programme were followed by Bleksley's talks on science and radio plays. The subjects of some of these plays were famous scientists such as Archimedes, Marie Curie, Darwin, Edison, Galileo, Herschel, Marconi, Pasteur, Röntgen and Rutherford. The topics in his radio plays for schools included the makers of science, modern discoveries such as penicillin, man in space, and the wonders of a starry sky.[2] By 1953, he had delivered 400 broadcast talks on science and authored 50 radio plays. But he could not really afford the time, especially as the rewards were only 35 cents per minute of broadcasting. Two series of radio plays on scientific topics, written for school broadcasts, were recorded and made available in other countries by UNESCO.[1] Bleksley's 'gravelly' voice became familiar to thousands of listeners through the three programmes, *Log Book, The Voice of Science* and *Test the Team.*

Test the Team was broadcast on Springbok Radio (1957–1985) and on Radio South Africa (1986–88). The original members of the panel were Grant Louden in Durban, and Eric Rosenthal and Arthur Bleksley in Johannesburg; the presenter was Dewer McCormack in Cape Town. The broadcast was live and the members of the panel and presenter communicated by telephone while on air. Although Bleksley and McCormack met, briefly, only once, they formed a friendship over the telephone. If there was a question the panel could not answer, Bleksley would encourage the panel to analyse the question and deduce the answer. Louden said that Bleksley had the 'finest deductive brain' of any person he had come across.

Bleksley retired from radio broadcasting in 1977 after about 40 years, during which time it is estimated that he spoke more than five million words into the microphone (Fig. D online).

Bleksley's voice on the radio has been described as somewhat slow and calculating as he thought carefully about what he was saying, using straightforward language to explain complicated science. But he was not completely happy with radio as a medium of communication, observing: 'You speak, hundreds of thousands may hear you. Then your words are gone forever.' He kept the scripts of all his radio talks in leather-bound volumes in his study at home, thinking that someone might like to read them one day and that they might become valuable Africana. His scripts may be of interest to students in the field of science education and journalism.

The press

Bleksley wrote more than 400 popular articles on science in the South African press, with whom he always actively cooperated. Burnton's bibliography[1] includes many of these articles. Every newspaper group and the SABC contributed willingly and generously to the function at the Planetarium on 19 August 1968 that marked Bleksley's last lecture as director. Paying tribute to Bleksley before the lecture, the president of the Newspaper Press Union called Bleksley a 'pressman's dream', at all times polite and helpful.

An example of Bleksley's helpfulness is given by Ian Reid, who, in 1955, was a young reporter for the South African Press Association in Johannesburg, travelling by train to Grahamstown for the S_2A_3 annual congress. Bleksley was presenting a paper [S1] on solar energy at the congress and was on the same train. They met in the dining saloon, Bleksley with his wife and very young daughter. Reid was carrying about eight advance copies of papers to be presented by delegates, which he had to put into understandable English but even whose titles he did not

understand. Bleksley took the papers and instructed Reid to call at his hotel in Grahamstown after eight that evening. In the interim, Bleksley put each paper into layman's language for him.

Bleksley was instrumental in founding the Science Writers Association of South Africa in 1959. In his 'Science and society' address in Lourenço Marques in 1958, he had suggested that such an association be founded in South Africa, to encourage good science reporting [G3]. Bleksley became its first president. In 1964, the association introduced a bronze medal, the Bleksley Medal, awarded annually to the South African journalist who makes the most significant contribution to science writing. Commenting on the award, the *Rand Daily Mail* said that, honouring Bleksley, it carried the fitting name of one who 'in making science understandable to the public has demonstrated that lucidity does not require the sacrifice of validity'.

The man

Bleksley has been described as warm and friendly, benign, affable, with a sense of humour, wide forehead, eyes twinkling behind horn-rimmed glasses, and old world manners. He talked fluently in technical scientific language in both English and Afrikaans. From his early life in the Karoo he could speak Xhosa. He read widely, including poetry and science fiction, and he remembered what he read.

He regarded himself as 'an amateur in the good sense of the word'. His isolation in his early years of research meant that he had largely trained himself as a researcher. Many eminent past scientists, such as G.I. Taylor in fluid mechanics, also called themselves amateurs, and, Bleksley observed [G3], Darwin, Mendel, Herschel, Marconi and Franklin too were largely self-trained amateurs.

As he explained in his Lourenço Marques address in 1958 [G3], Bleksley believed that scientists must be prepared to play their part in educating the lay public about science. The public is aware that it needs to know about science, and there is an audience waiting. He saw the universities as having an important role 'as the centre of the intellectual life, not merely of a few thousand students and a few hundred members of its staff, but of the entire community which it exists to serve.' He believed that universities should encourage many more people to participate actively in science and not merely listen passively. Universities can reach only a small part of the total population and they needed help from the radio and the press, for 'both possess the right of entry to almost any home in the civilized world.' He thought that science coverage in newspapers and radio programmes was not in proportion to the importance of science. By the time of his retirement scientists' attitudes had changed: 'Scientists no longer live in ivory towers. To-day I cannot think of anyone who would not take part in a discussion on radio or television if asked.'

Bleksley believed that more women should be encouraged to consider higher education and be told of the promising future awaiting them in science [G3]. He understood the economic pressures that forced girls to leave school early, and the need to provide adequate financial assistance through bursaries and scholarships. He was always prepared to assist less privileged South Africans. Among many he helped was Kantilal Naik, who, until his retirement in 2003, was a senior lecturer in the School of Computational and Applied Mathematics at Wits. It was Bleksley who arranged a study bursary at Wits for him and later provided moral and academic support during Naik's detention by the Security Police in the early 1970s.[6]

Conclusions

Bleksley's early research in astrophysics on variable stars was known beyond South Africa. After World War II, he did not resume his work on astrophysics and his subsequent publications were mainly review papers. His choice of subjects showed prescient judgment of fields that had future importance—nuclear and solar energy, interplanetary space travel and computer applications.

He may have been influenced by the example of Eddington, who had made general relativity and quantum mechanics accessible to the public in the 1920s and 1930s through his lectures and books and on the air. Bleksley's broadcasts, popular scientific articles in the press, and directorship of the Johannesburg Planetarium did the same for South Africa.

Much of the material on which this article is based was obtained from the file of Professor Bleksley in the Central Records Office of the University of the Witwatersrand, Johannesburg. I thank Lesego Phachane and Marius Coetzee, the present and previous Records Managers of the Central Records Office, for making Bleksley's file available to me and for their assistance. The letter in Fig. A (online) written by Professor Bleksley and that in Fig. B written by Professor MacCrone form part of the holdings of the University of the Witwatersrand, and are published with the kind permission of the university. I thank Avusa Media Ltd for granting permission to reproduce additional photographic material in the supplementary material online. I also thank the following colleagues for reading drafts of this article and for their comments and input: Anthony Starfield, Kantilal Naik, Douglas Wilson, David Sherwell, David Block, Shirley Abelman and Jo-Anne King.

1. Retirements. Professor A.E.H. Bleksley. *Gazette of the University of the Witwatersrand, Johannesburg,* No. 34, December 1968, p. 12.
2. Burnton R. (1970). *Arthur E.H. Bleksley.* A bibliography compiled in part fulfillment for the requirements of the Diploma in Librarianship, University of the Witwatersrand, Johannesburg.
3. Murray B. (1997). In *Wits The 'Open' Years,* chaps 3 and 8. Witwatersrand University Press, Johannesburg.
4. Carruthers J. (2008). Scientists in society: Royal Society of South Africa. *Trans. R. Soc. S. Afr.* (Royal Charter Centenary Issue), **63**, 1–30.
5. Eddington A. (1930). *The Internal Constitution of the Stars.* Cambridge University Press, Cambridge.
6. Dr Naik remembers his association with Bleksley as follows:
'My first meeting with Professor Bleksley was in 1958 when I went with my late father and family friend to see him to seek guidance relating to my studies at the University of the Witwatersrand in 1959. He was friendly and asked me what I wanted to do. I told him that I was keen on studying for pharmacy, to which he replied jokingly, 'Pharmacists sell more cameras than they sell medicines'. The following year I enrolled for a B.Sc. degree with applied mathematics and chemistry as major subjects.
While studying, I lost my father in 1960. I had difficulty in paying fees and approached Professor Bleksley for assistance. He was extremely helpful and as chairperson of the bursary committee he arranged a bursary for me. He was always prepared to help less privileged students.
When I was a science teacher at Roodepoort Indian High School, I wrote a textbook *Calculations in Physical Science* for matriculants and first-year university students. After studying the contents, Bleksley gave me a very positive foreword for the book.
When I was detained by the Security Police in October 1971 for almost six months at John Vorster Square in Johannesburg, Professor Bleksley wrote a testimonial on my behalf. The police brought the testimonial to my cell to show me. I had tears of appreciation in my eyes. The testimonial undoubtedly helped me during my detention.
When I completed my doctoral thesis, Bleksley was one of the persons to whom I dedicated my work, in appreciation of his invaluable help to me.'

Selected bibliography of works of A.E.H. Bleksley

Books – Authored

Bleksley A.E.H. (1963). *Textbook of Applied Mathematics,* Vol. 1. *Elementary Mechanics;* formerly *Elementary Applied Mathematics.* Central News Agency, Johannesburg, 3rd edn (1st edn 1947; 2nd edn 1955).

Bleksley A.E.H. (1961). *Textbook of Applied Mathematics,* Vol. 2. *Analytical Mechanics.* Central News Agency, Johannesburg, 2nd edn (1st edn 1950).

Thesis

Bleksley A.E.H. (1936). *A statistical and analytical study of the phenomena of Cepheid and long period stellar variability.* D.Sc thesis, University of the Witwatersrand, Johannesburg.

Inaugural lecture

Bleksley A.E.H. (1956). *The Problems of Cosmology.* Witwatersrand University Press, Johannesburg.

Papers – In astrophysics

A1. Bleksley A.E.H. (1932). Note on the theory of Cepheid variation. *S. Afr. J. Sci.* **29**, 139–152.
A2. Bleksley A.E.H. (1932). Second note on the pulsation theory of Cepheid variation. *S. Afr. J. Sci.* **29**, 153–161.
A3. Bleksley A.E.H. (1933). The spectrum of Mira

Ceti from the Cape spectrograms. *S. Afr. J. Sci* **30**, 132–136.
A4. Bleksley A.E.H. (1933). On the origin of emission lines in the spectra of long-period variables. *S. Afr. J. Sci.* **30**, 137–145.
A5. Bleksley A.E.H. (1933). On the determination of spectroscopic parallaxes from the Cape spectrograms. *S. Afr. J. Sci.* **30**, 171–175.
A6. Bleksley A.E.H. (1934). Note on the sun's heat. *Popular Astronomy* **42**, 109–116.
A7. Bleksley A.E.H. (1934). Loss of mass in binary systems. *Nature* **133**, 613.
A8. Bleksley A.E.H. (1934). Relation between radius and temperature in the Cepheid variables. *Nature* **134**, 661.
A9. Bleksley A.E.H. (1934). The radius–luminosity relation in the Cepheid variables. *The Observatory* **57**, 343–344.
A10. Bleksley A.E.H. (1934). Statistical studies of the variable stars. I. The emission line displacements in the Mira variables. *Astronomische Nachrichten* **254**, 65–76.
A11. Bleksley A.E.H. (1934). Note on the displacement of the bright lines in the spectra of long-period variables of type M. *S.Afr. J. Sci.* **31**, 166–172.
A12. Bleksley A.E.H. (1935). The relation between the bolometric magnitudes and the temperatures of stars. *Astronomische Nachrichten,* **254**, 297–302.
A13. Bleksley A.E.H. (1935). The loss of mass by radiation and the binary star problem. *Zeitschrift für Astrophysik* **9**, 258–265.
A14. Bleksley A.E.H. (1935). Studies in stellar statistics: I. On the reduction from visual to bolometric magnitudes. *S. Afr. J. Sci.* **32**, 118–124.
A15. Bleksley A.E.H. (1935). Note on the Milne diagram for the Cepheid variables. *S. Afr. J. Sci.* **32**, 125–128.
A16. Bleksley A.E.H. (1936). On the relation between radius and temperature in Cepheids. *Zeitschrift für Astrophysik* **11**, 59–70.
A17. Bleksley A.E.H. (1936). The Cepheid variables and black-body radiation. *Nature* **138**, 286.
A18. Bleksley A.E.H. (1936). The delta Cepheid variables and black-body radiation. *Astronomische Nachrichten* **260**, 161–165.
A19. Bleksley A.E.H. (1936). Note on the variations in radius and temperature in certain delta Cephei variables. *Astronomische Nachrichten* **260**, 165–170.
A20. Bleksley A.E.H. (1937). Studies in stellar statistics: II The radii of the stars. *S. Afr. J. Sci.* **33**, 144–146.
A21. Bleksley A.E.H. (1937). The radial velocities and absolute magnitudes of the long period variables of spectral class Me. *S. Afr. J. Sci.* **33**, 147–152.
A22. Bleksley A.E.H. (1937). Note on certain statistical relationships in the Cepheid and long period variable stars. *Zeitschrift für Astrophysik* **13**, 333–346.
A23. Bleksley A.E.H. (1937). The pulsation variables: A statistical and analytical study of phenomena of Cepheid and long period stellar variability. *S. Afr. J. Sci.* **34**, 135–168.
A24. Bleksley A.E.H. (1938). Note on the period and light curve of a new Algol variable. *Bulletin of the Astronomical Institutes of the Netherlands* **8**, 285–286.
A25. Bleksley A.E.H. (1942). A statistical study of mass, density and radius in some eclipsing binaries. *S. Afr. J. Sci.* **38**, 133–140.
A26. Bleksley A.E.H. (1943). Studies in stellar statistics: III The relation between mass, luminosity and temperature. *S. Afr. J. Sci.* **40**, 98–103.

Papers – In mathematics

M1. Bleksley A.E.H. (1929). The principle of superposition and its application in geometry. *Annals of the University of Stellenbosch* **7**, 1–15.
M2. Bleksley A.E.H. (1942). Note on the straight line of best fit for a set of coplanar points. *S. Afr. J. Sci.* **38**, 141–144.
M3. Bleksley A.E.H. (1945). Note on some geometrical properties of the coefficient of correlation. *S. Afr. J. Sci.* **41**, 102–105.

Papers – In nuclear energy

N1. Bleksley A.E.H. (1943). Some engineering aspects of nuclear physics. *Transactions of the South African Institute of Electrical Engineers* **34**, 89–108.
N2. Bleksley A.E.H. (1943). Recent advances in nuclear physics. Presidential Address to Section A. South African Association for the Advancement of Science. *S. Afr. J. Sci.* **40**, 15–29.
N3. Bleksley A.E.H. (1943). An electrostatic generator for one million volts. *S. Afr. J. Sci.* **40**, 104–108.
N4. Bleksley A.E.H. (1949). Nuclear energy. *Transactions of the South African Institute of Electrical Engineers* **40**, 127–143.
N5. Bleksley A.E.H. (1949). The generation of stellar energy. *Monthly Notes, Astronomical Society of South Africa* **8**, 61–64.

Papers – In cosmology

C1. Bleksley A.E.H. (1950). A new approach to cosmology: I. *S. Afr. J. Sci.* **46**, 343–346.
C2. Bleksley A.E.H. (1950). A new approach to cosmology: II. *S. Afr. J. Sci.* **47**, 13–15.
C3. Bleksley A.E.H. (1951). A new approach to cosmology: III. *S. Afr. J. Sci.* **48**, 20–24.
C4. Bleksley A.E.H. (1953). A new approach to cosmology: IV. *S. Afr. J. Sci.* **50**, 61–64.

Papers – In quantum mechanics

Q1. Bleksley A.E.H. (1947). The Heisenberg principle of indeterminacy. *South African Science* **1**, 64.
Q2. Bleksley A.E.H. (1950). *Groepe-teorie en Atoomstruktuur.* Rubbi Lectures, University of Stellenbosch.

Papers – In solar energy

S1. Bleksley A.E.H. (1955). The utilisation of solar energy. *S. Afr. J. Sci.* **52**, 37–41.
S2. Bleksley A.E.H. (1956). The world symposium on applied solar energy. *S. Afr. J. Sci.* **52**, 253–256.

Paper – In parapsychology

P1. Bleksley A.E.H. (1963). An experiment of long-distance ESP during sleep. *J. Parapsychol.* **27**, 1– 15.

Papers – General

G1. Bleksley A.E.H. (1945). Some problems of interplanetary travel. *S. Afr. J. Sci.* **41**, 485–493.
G2. Bleksley A.E.H. (1953). The origin of the solar system. *S. Afr. J. Sci.* **49**, 224–228.
G3. Bleksley A.E.H. (1958). Science and society. *S. Afr. J. Sci.* **54**, 253–262.
G4. Bleksley A.E.H. (1959). Note on an experiment in forecasting the results of a general election with an electronic computer. *S. Afr. J. Sci.* **55**, 99–102.
G5. Bleksley A.E.H. (1960). The Johannesburg Planetarium. *S. Afr. J. Sci.* **56**, 173–178.
G6. Bleksley A.E.H. (1962). Note on an experiment in forecasting the referendum result with an electronic computer. *S. Afr. J. Sci.* **58**, 35–38.
G7. Bleksley A.E.H. (1962). An investigation of the reliability of certain examinations. *S. Afr. J. Sci.* **58**, 93–99.

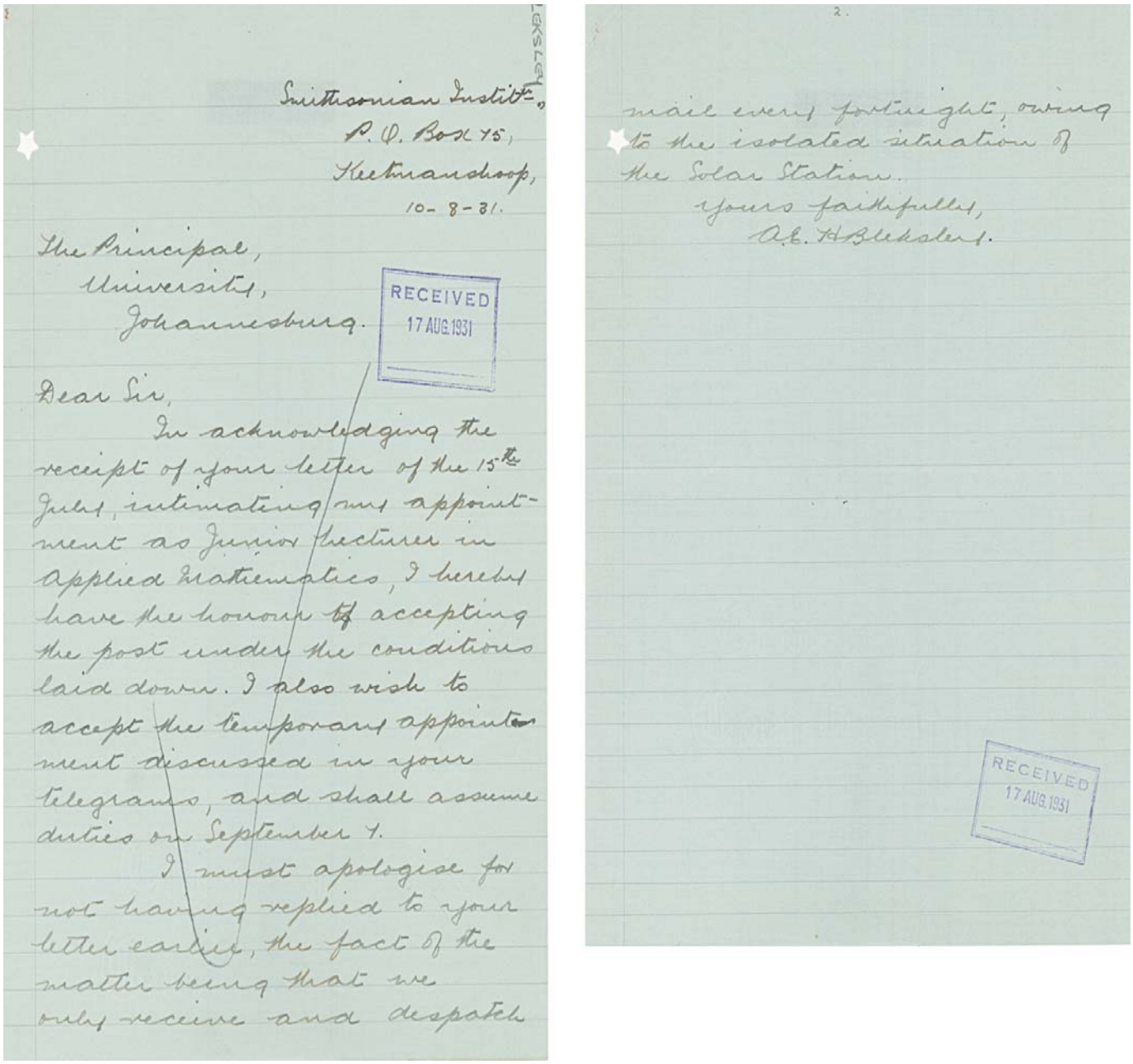
This article is accompanied by additional pictures and references to newspaper articles in the Wits archives online at www.sajs.co.za

Supplementary material to:

Mason D.P. (2009). Arthur Bleksley: pioneer of science awareness in South Africa *S. Afr. J. Sci.* **104**, 423–427.

References to newspaper articles in the Wits University archives

Sunday Times reporter (1968). Popular scientist. *Sunday Times* (Johannesburg), December, 8.
Weston L. (1975). The voice of science. *Star* (Johannesburg), December, 10.
Star reporter (1981). The Bleksleys – still starry-eyed after their 50 golden years. *Star* (Johannesburg), November 12.
Mail reporter (1969). The compleat scientist. *Rand Daily Mail* (Johannesburg), January, 1.
Mail reporter (1953). Bleksley is new Wits professor. *Rand Daily Mail* (Johannesburg), January, 21.
Menge L. (1968). Popular man of figures to retire. *Rand Daily Mail* (Johannesburg), July, 4.
Waite J. (1984). Dr Bleksley, doyen of radio and science, dies. *Star* (Johannesburg), July, 9.
Staff reporter (1968). Praise from all for Mr Science. *Rand Daily Mail* (Johannesburg), August, 20.
Mail reporter (1984). Radio's Mr Science is dead. *Rand Daily Mail* (Johannesburg), July, 10.
Citizen reporter (1984). Quiz whizz Bleksley dies at 76. *Citizen* (Johannesburg), July, 10.
Vaderland reporter (1984). Arthur Bleksley SA se bemindste wetenskaplike. *Vaderland* (Johannesburg), July, 11.
Reid I. (1984). Genius with the common touch. *Rand Daily Mail* (Johannesburg), July, 11.
Mail reporter (1964). For science. *Rand Daily Mail* (Johannesburg), September, 24.



Smithsonian Institute,
P. O. Box 45,
Kettmanshoop,
10-8-31.

The Principal,
University,
Johannesburg.

RECEIVED
17 AUG. 1931

Dear Sir,

In acknowledging the receipt of your letter of the 15th July, intimating my appointment as Junior Lecturer in Applied Mathematics, I hereby have the honour to accepting the post under the conditions laid down. I also wish to accept the temporary appointment discussed in your telegram, and shall assume duties on September 1.

I must apologise for not having replied to your letter earlier, the fact of the matter being that we only receive and despatch

2.

mail every fortnight, owing to the isolated situation of the Solar Station.

Yours faithfully,
A.K. H. Bleksley.

RECEIVED
17 AUG. 1931

Fig. A. Letter of acceptance of the appointment as junior lecturer sent by Bleksley from the solar observatory at Mount Brukkaros to the university principal, Professor Raikes.

23rd October, 1968

S3/6. P28.WH

Professor A.E.H. Bleksley,
Department of Applied Mathematics,
University.

The Johannesburg Planetarium

On your retirement you will be receiving warm and well-deserved tributes to the service which you have rendered as a professor of the University. I write now to convey the Council's sense of indebtedness and gratitude to you for your very special contribution to the reputation of the University, and to the life of our city, in bringing the Johannesburg Planetarium into being at the University and, as its first Director, in ensuring its success as an educational amenity for the citizens of Johannesburg and their children. Without your zeal and enthusiasm, Johannesburg would not have acquired the Zeiss instrument; and to your direction we owe the high level of technical efficiency in the operation of the instrument, the scientific accuracy of the presentations at the Planetarium, and the assured place which the Planetarium has gained in popular interest. We have particular reason to be grateful to you for having trained a successor who shares your enthusiasm and has learned from you not only an ability to run the Planetarium but also a respect for the exacting standards which you have established. I would like you to feel assured of our very warm gratitude for your unstinting honorary services in connection with the Planetarium, and I hope to arrange that they will be commemorated in an appropriate, permanent form in the Planetarium foyer.

Yours sincerely,

I. D. MacCrone,
Vice-Chancellor and Principal

Fig. B. Letter written by the vice-chancellor and principal of the University of the Witwatersrand, Professor I.D. MacCrone, to Bleksley on the subject of the planetarium.

Fig. C. Special function organized by the South African Association for the Advancement of Science at the Johannesburg Planetarium for Bleksley, when he presented his last lecture as director on 19 August 1968. From the left, Mr du Toit (chairman of the Newspaper Press Union), Professor Bleksley, Professor Raymond Dart, and Professor J.P.F. Sellschop (chairman of the Johannesburg Branch of S_2A_3). (Originally published in the *Rand Daily Mail,* 20 August 1968. © Avusa Media Ltd.)

Fig. D. Bleksley at the SABC. He was in radio broadcasting for forty years and spoke more than five million words into the microphone. (Originally published in *Die Vaderland,* 11 July 1984 and reproduced with permission.)