

Register 14/6/22

Register 19/6/22 Register 20/6/22
Mr. H. W. Sanders

UNIVERSITY LECTURES.

RELATIVITY AND GRAVITATION.

Professor J. R. Wilton on June 6 gave the first of three lectures at the University of Adelaide on "Relativity and the modern theory of gravitation." It was the opening of the winter series of extension lectures, and there was a crowded attendance. On Tuesday night he delivered the second part of his portion of the programme, and there was again a "full house." After having briefly reviewed the previous lecture, Professor Wilton stated Einstein's two postulates of relativity in the form:—"1. It is impossible by any conceivable experiment to detect absolute motion with uniform velocity in a straight line. 2. The velocity of light is the same for all observers." He proceeded to deduce, as consequences of those two postulates of Einstein's, the fact that the measurement of a given length, or of a given interval of time, depends on the velocity of the observer who measures it. That dependence, he said, was in no sense arbitrary. It was perfectly definite; so that, given the relative motion of two observers, he could state precisely how their measures of length and time would differ from one another. For example, if A was moving relatively to B at 18 miles a second (the velocity of the earth in its orbit), a distance which B measured as 186,000 miles A would make about 4 ft. 7 in. longer, and an interval of time which B measured as one second A would make the two-hundred-millionth part of a second less. But on the other hand—and this was the remarkable fact of relativity—a distance which A measured as 186,000 miles B would make 4 ft. 7 in. longer, and an interval of time which A measured as the second B would make the two-hundred-millionth part of a second less. He might put the matter rather pictorially thus:—Two men, A and B, were in rapid relative motion. At the instant when they passed one another A handed over to B a clock and a yardstick. It appeared to A that the yardstick contracted and that the clock began to lose. At the same instant B handed over to A a clock and a yardstick. It appeared to him that the yardstick shrank and the clock began to lose. In both cases the rod contracted and the clock lost from the point of view of the man who handed them over.

—Space and Time.—
Professor Wilton went on to say that if he were asked whether the contraction of a rod when set in motion was real, he would reply that it would, at any rate, seem to be real; that, in fact, if the rod were given a velocity of 160,000 miles a second it would appear, to an observer who was at rest, to be only half as long as when it was at rest. Further, a clock travelling with that velocity would appear to him to go at only half the rate it had when at rest, so that it would lose 12 hours in the 24. But an observer moving with the rod or clock would not notice any difference, to him the length and rate would be quite unchanged. If he were asked, said the lecturer, whether there was any useful end to be gained in bothering about a theory which required such extraordinarily minute changes in length and time—so long as we were not dealing with velocities approaching the velocity of light—he would reply that the Michelson-Morley experiment showed that some such theory was necessary in order to explain the fact when very delicate methods of observation were employed; and, on the other hand, we had sometimes to deal with velocities approximating to that of light. For instance, the Beta rays of radium consisted of electrons shot out with velocities which might be as great as 180,000 or even 180,000 miles a second. He further explained that, although the electrons were far too small for it to be possible to detect the change in length due to their velocity, it could be, and had been, verified experimentally that the mass of an electron increased with its velocity, in accordance with another deduction from the principle of relativity. Returning to the main subject of the lecture, space and time, said the professor, were inextricably entangled. In the words of Minkowski, "From henceforth space in itself, and time in itself, sink to mere shadows, and only a sort of union of the two maintains an independent existence." There would not be time in that lecture to explain at all adequately the way in which Minkowski elaborated the idea contained in those words, but as for the comprehension of the next lecture, some knowledge of what was meant by the space-time continuum would be necessary, it was desirable to explain, very briefly, Minkowski's four-dimensional world in so far as it was necessary to a comprehension of what was meant by space-time. By a simple illustration it was shown that four data were necessary in

any ordinary appointment—three to fix position in space and one to fix position in time. What Minkowski had done was to use the absolute character of the velocity of light to enable him to represent an interval of time by the length of a line. He might, in fact, take the distance which light travelled in a second to represent a second of time. On that scale a foot would represent the thousand-millionth part of a second of time. He was then able to represent space-time (the space-time continuum, as it was called) by a geometry in four dimensions, a geometry which he could not—and must not—try to picture; and he was able to carry over to the theory of relativity a number of results which had been obtained by pure mathematicians, who—not being concerned with reality, but interested to know what would follow if there were four dimensions—had long before worked out a fairly complete theory of four-dimensional geometry.

—General Theory of Relativity.—
"Now," concluded Professor Wilton, quoting a simile which he had taken from the young German physicist, Max Born, "if a Fritz sausage is cut in different ways, holding the knife at different inclinations both to the horizontal and to the length of the sausage, we get sections of very different shapes and sizes. So, says Born, if I take a section of the four-dimensional space-time in any particular way I arrive at the sort of distance and time that correspond to the measurements of some particular observer, while if I take sections in all sorts of different ways I obtain distance and time corresponding to the measurements of observers moving (each with constant velocity) in all sorts of different ways. This leads up to the general theory of relativity, the subject of the concluding lecture, which will be delivered on Tuesday evening next."

Advertiser 15/6/22
Music Examinations

MUSIC EXAMINATIONS.

From H. E. FULLER, local secretary, Trinity College, London:—Mr. E. Howard has written regarding a circular issued by the University Examinations Board, which evidently contains rash statements. I have not seen it, but I think it only right that teachers who prefer examinations of the visiting colleges should be informed that the circular as quoted by Mr. Howard is misleading and incorrect. Of course it is only natural that the local institution should in its parochialism disparage others, though individually some of its members are only too keen to meet the visiting examiners, and earn the latest musical ideas from London. I have in front of me, too, an address given by one member of the W.E. Board, a few years ago, from which I quote:—"I certainly compliment—upon getting the practical teachers' diploma of Trinity College. This is, I assure you, a very worthy achievement. Some persons are prone to disparage the examinations of Trinity College. Bogus colleges are numerous in England. Some of them have been represented here, and possibly in the minds of some, T.C. has been associated with those. So far from this being true, it is affiliated with the University of London, and recently gave £5,000 towards the endowment of the Chair of Music at that, the proudest University in the world. Thus do not, in my opinion, bogus colleges, however. In the practice of music, the T.C. honors' certificate is worth having." As regards the fees, I am not in the position, being only a local secretary, to give details of the college's finances. I know, however, that the income and property of the college, from whatever sources derived, are applied solely to the objects of the college, and no part of it is diverted, directly or indirectly, by way of profit to members of the corporation. Our syllabus shows that £165 is given annually in exhibitions to students throughout the Dominions and India, and several have passed through my hands for S.A. candidates. Again, several Australian students have obtained scholarships, entitling them to free tuition at the college, notably Miss Hilda Feistead, of Adelaide, who was at the college for three years, receiving an allowance, as well as tuition. I know, too, that the expense of travelling by sea and land has increased enormously, and the local expenses of the examiners, for board, &c., and the huge increase in the rates for advertising, must have reduced the income of the college very much, though no increase has been made in the fees, except in the two lowest grades. The fact remains that the T.C. exams, now so widely esteemed (as evidenced by the record entries last year in S.A.), have been more effective in raising the standard of pianoforte teaching and playing throughout Australia during the past 25 years than any other influence whatever.

Our London correspondent, in a message on Saturday, stated that the list of Wranglers in the mathematical tripos at the Cambridge University included Mr. Harold W. Sanders, B.A., of Cambridge University, who has been appointed lecturer in mathematics at the University of Adelaide, and will assume the duties there at the beginning of next year. He is the eldest son of Mr. William Sanders, of Charles street, Norwood, the well-known musician, and first attended the Rose Park Public School in 1899. He was then only six years old, but he displayed such aptitude for arithmetic that the head master at that time (Mr. Wittber) found it necessary to put him in a class usually far beyond the attainments of so young a pupil. When he was 10 years of age he was transferred to the Norwood Public School, where the late Mr. Alfred Williams (afterwards Director of Education) was in charge. Before he was 12 years of age the lad had won the St. Peter's College open scholarship, and also a bursary entitling him to three years' tuition at Prince Alfred College. He proceeded to the St. Peter's institution. In his second year Harold won the Farrell Open Scholarship, and later he was dux of the college. He was third in the 1907 senior examination honours list, and two years afterwards he was first in honours for mathematics in the higher public examination and second in the general honours list. He was then only in his sixteenth year, and the student (a Western Australian) who obtained first in general honours was over 20. For his achievement in that examination Mr. Sanders received the Hartley Studentship, which entitled him to free University tuition. There he made a special study of mathematics, and secured first-class honours when he obtained his B.A. degree. Mr. Sanders in 1914 accepted a position as lecturer in mathematics and physics at the Perth Technical School, and in 1916 he joined the staff of the Perth University. About two years ago he was granted leave from that university to proceed to Cambridge and continue his mathematical studies, and recently he resigned his position in Perth to accept the lectureship in mathematics at the Adelaide University. While at Carus College, Cambridge, Mr. Sanders won the college scholarship. He married a daughter of the Rev. W. Armstrong, a prominent Anglican clergyman in Western Australia.

Register 20/6/22
Mr. H. W. Sanders



MR. HAROLD W. SANDERS, B.A.,
Whose name appears in the latest list of Wranglers in the mathematical tripos at the Cambridge University, and who has been appointed lecturer in mathematics at the Adelaide University as from the beginning of next year. Biographical particulars concerning Mr. Sanders were published in The Register on Monday.

ELDER CONSERVATORIUM.

SUCCESSFUL ORCHESTRAL CONCERT.

Judging by the performance of the Elder Conservatorium String Orchestra, at a largely attended concert given in the Elder Hall on Monday evening, there are indications that orchestral music will be more frequently heard than it has been in the past. Under the conductorship of Mr. W. H. Foote, A.R.C.M., the orchestra has made very noticeable improvement, and its future career will be closely observed by all whose interest in music is more than casual. Indeed the fact that the orchestra has become so firmly established is eloquent testimony to the number of musical enthusiasts in the community. The Director of the Conservatorium (Prof. E. Harold Davies, Mus. Doc.), in addressing the audience on Monday evening—among whom was the Lieut.-Governor (Sir George Murray)—said he regarded the occasion as somewhat exceptional, and, to him, one of special pride, since it was the first time in their life, as a conservatorium, and the first time, he thought, in the life of the State, that a students' orchestra, fully organized and systematically trained, had attempted a programme of classical music, including on its first appearance a performance of Schubert's Unfinished Symphony. That, in his judgment, was a noteworthy achievement, and in asking His Excellency to be present that evening, he had been bold enough to suggest to him that they should be "making history." But it was not the actual accomplishment that he would stress, so much as the rich promise that event contained for the future of orchestral playing in the State of South Australia. They were very fortunate in having at their disposal the exceptional gifts and wide experience of Mr. Foote as the teacher of the students. They wanted to keep him with them, and above all wanted the good work to go on to its complete fulfilment. He was anxious for their help and interest as a people. In thinking of music as a subject of education, too many of their students turned their eyes to the piano, to singing, or it might be, to the violin, only. Those were all excellent, all desirable, but he would like the students, and his audience too, as their guardians and friends, to think more often of the many orchestral instruments which were also waiting to be taken up enthusiastically. Orchestral music was among the richest of their musical lore, and orchestral playing one of the finest trainings for musicianship that any student could have. He hoped, therefore, that that evening's performance would not only give them all the pleasure and pride they might have anticipated, but encourage them to go much further in so profitable a way, until, it might be, they might have enough capable young players to make not one orchestra, but half a dozen first-class orchestras for the spread of musical education through Australia. (Applause.)

A diversified and comprehensive programme was performed, and received with enthusiastic applause. The excellent rendering by the orchestra of the National Anthem was worthy of praise, and apart from the patriotic significance of that song one could not fail to be impressed with the musical quality displayed. The opening overture was the spirited "Nabucodonosor" (Verdi), and full justice was done, not only the execution of its intricate passages but its grand climaxes. In contrast, Frank Bridge's "Serenade" was a morceau of beauty and tranquility, which the players rendered according to the composer's intention for it. Perhaps the most brilliant and impressive of the numbers was Schubert's "Unfinished Symphony," which raised the emotions to great tension and played vigorously upon the imagination. Here all sections of the orchestra were actively employed, and great tone volume was created with the assistance of the brass instruments. One of the most enjoyable of the numbers was the Concerto for two violins and strings (Bach), written in three movements. With this item lovers of Bach's style were well satisfied. Much credit is due to the soloists—Misses Doreen Stoneman and Aila Zevern. Scharwonka's Polish dance was a brilliant and appropriate finale to a splendid programme. Great appreciation was accorded the fine vocal efforts of Miss Valda Harvey, who sang "I said nought would frighten me here," from Carmen (Bizet), and Mr. Ewart Lock, whose bass voice was amply displayed in "Friend of the brave" (Calcott). Miss Martha Melva Williams's violoncello solo, "Romance sang Taroles" (Davidson), was well played, and Miss Ariel Shearer was an able accompanist.