

# The Future Development of Higher Technological Education and its Effect on the Professional Engineering Society\*

MR. C. W. TONKIN, B.Sc. (Chairman) (Associate Member of Council), opening the discussion said that the Institute, by its Charter, was pledged to concern itself with the science and practice of marine engineering. It must inevitably be very closely concerned, therefore, with technical education for the engineer with particular reference to marine engineering. By that same token, it must be closely concerned with anything affecting the technical colleges, because it was through the technical colleges that the bulk of the members of the Institute obtained their technical education; relatively few came via the Universities. Thus, anything that affected the technical colleges either directly or indirectly affected the outlook of the Institute.

Some months ago, the Institute was asked by the National Advisory Council on Education for Industry and Commerce to comment upon a draft report dealing with the problem of the future development of higher technological education. This draft report was concerned with the supply of well-trained technical personnel and the raising of the standard of their training. The Institute was one of many bodies that were consulted. A list of these bodies would be found in Appendix A of the final report.† It was an awe-inspiring list. In due course, the Institute had sent in its comments, and it was the final printed report that was the subject of discussion.

It was strange but nevertheless true that although provision for engineering was widespread in technical education and as engineers they could claim that it was probably the best, it was a major headache to make really workable suggestions. It might not be inappropriate to refresh their memories, therefore, as an introduction to the discussion, on the various discussions and reports that had formed the origin—or background—which had led to the issuing of the report.

In 1943 the Board of Education—as it then was—issued a white paper on educational reconstruction, and this provided for the beginnings of regionalization. In the same year the Institution of Mechanical Engineers issued a short report on the impact of the white paper suggestions on training for mechanical engineering. That report gave appreciable attention to the provision actually made in technical colleges. Here were the beginnings of the reactions of the professional institutions.

In 1944 came the Education Act itself, with its very important clause, Section 41, which said that it should be the duty of every local education authority to secure the provision in their area of adequate facilities for further education, full-time and part-time, for persons over compulsory school age. This was in contrast to the previous state of affairs where local authorities were encouraged but not compelled to make such provision. This was a further step towards the provision of higher technological training.

\* Discussion following the Annual General Meeting of the Education Group on 16th March 1951. The Minutes of the Proceedings of this meeting will be found in the TRANSACTIONS 1950, Volume LXII, p. 1.

† Ministry of Education: The Future Development of Higher Technological Education. Report of the National Advisory Council on Education for Industry and Commerce. His Majesty's Stationery Office. 1950. Price 1s. net.

In December 1944 the Institution of Electrical Engineers produced a second report on education and training for engineers, and this report concerned itself to a considerable extent with regional technical colleges, local technical colleges, and technical institutes, and with the provision made in general for technical education. Attention was paid to the requirements for further technical education and to the functions of the technical colleges.

In 1945 came the Percy Report on higher technological education, and this report was, of course, concerned with the higher technologies. In paragraph 33, the suggestion was made that there should be regional advisory councils concerned with the co-ordination of technological studies in universities, colleges of technology and other technical colleges. Reference was then made to an academic board which would have the function of advising the governing bodies on the development and co-ordination of higher technological studies in the institutions in the regions as a whole. There was next the suggestion that these regional bodies should have a national counterpart in the national council of technology, as it was then called. This had come about approximately in the National Advisory Council.

Following the Percy Report came the well-known Circular 94 of the Ministry which was concerned with another aspect of higher technology in the technical colleges—research. And how most of those present wished very much more could be done in that direction! The amount done at present was negligible, and the main cause, as everyone was perfectly well aware, had been the absolute inability of the local authorities to obtain the services of the right kind of technical teachers so that the present staff might indulge in research. This, of course, supported the contention that there was a dearth of trained technologists.

Another aspect of higher technology was brought out in 1947 in the Urwick Report on Management, which had brought many things in its train, with some of which the Institute might and with some of which it might not agree. This report dealt with management training, and in view of the recent revision of the Associate Membership examination, it did concern the Institute. There had been considerable discussion on whether a management section should be included in the Associate Membership examination.

In July 1947 the Parliamentary and Scientific Committee issued a report on colleges of technology and technological manpower in which considerable attention was paid to the regional organisation of technological education and to the idea of a national council.

The year 1947 was a prolific year. The Ministry of Education issued Pamphlet No. 8 which members had probably read, marked and inwardly digested. It dealt with the whole field of further education and paid considerable attention to various technologies.

Some people were still not clear as to the meaning of the terms that were used. In 1948 the Association of Technical Institutions had two papers, one by Dr. Docherty on the trend of technical education and one by Dr. Anderson on co-operation between the technical colleges and the universities in the field of higher technological education.

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In 1949 another group, the Study Group of the Federation of British Industries, weighed in with a report on the education and training of technologists, attention again being paid to colleges of technology and the idea of a central body which should issue or moderate or in some way control standards in order to raise them and make them national.

In February 1950 the Association of Technical Institutions once more issued a policy report on future developments in higher technological education—in this case presented by Mr. F. H. Reid, who would have been better qualified to open the present discussion. In 1950, too, a series of articles in the *Times Educational Supplement* put the case for the technical university. Things had gradually come to a head, some people arguing that there should be something in the style of the Massachusetts or California Institutes, others that a new university of technology should be founded; these articles put the case for a university.

In 1950 the University Grants Committee issued a note on technology in the universities so that there was a closer link with the universities or with the impact of this idea on the universities. The Institute of Physics also issued a report on the training of technologists, and in September 1950 Sir Ewart Smith read his very important paper to the British Association on the critical importance of higher technological education in relation to productivity—getting nearer to the bones of the problem.

In October 1950 there appeared the Report of the National Advisory Council itself, and then, the storm having rumbled for a considerable time in various professional bodies, there was quite a series of heated discussions in various places as to whether it was good, bad or indifferent. In December 1950 the Institution of Mechanical Engineers replied. They made certain reservations in giving their approval. The general idea seemed to have been approval of the main objects and purposes of the suggestions in the Report, but on all sides there were reservations as to one proposal or another. The Institution of Mechanical Engineers said that they did not support the Report in its present form; they regretted that there should be any confusion of functions by activities that were little related to the purpose. They recommended that the title of the body to be set up should clearly indicate its task of moderating. They disliked the titles of "member" and "fellow", particularly that of "member", which had a special significance in the various professional engineering institutions—the points to which objection were taken being points of detail rather than of general disapproval.

The Association of Technical Institutions, together with the Association of Principals of Technical Institutions, in 1950 made a further statement of policy on the future development of technological education, approving the Report and hoping for certain minor modifications.

To come to the Report itself, it was important to remember that it was concerned with all industries, and it would be as well to be clear as to the meaning of the terms used. The terms "technologist" and "technician" were in constant use. One dignified institution had tried to provide definitions, but in one of its latest publications it had used the same term for two different things. The Report of the National Advisory Council endeavoured to define higher technological education in a footnote on page 7:

"... of a standard at least equivalent to that of a University First Degree, or satisfying the educational requirements for corporate membership of a major professional institution".

In the Summary (page 20), the National Advisory Council referred to this definition.

Gradually, "technician" began to be used for the craft stages, and so there came to be a difference between the technologist and the technician.

Finally, there were the recommendations of the Report. After setting out the essential requirements and the views of the various bodies that had been consulted, the National Advisory Council said:

"We recommend:—

- (i) The development of new courses of advanced technology in the technical colleges in close association with industry and with the co-operation of the regional academic boards.
- (ii) Consideration by the Minister of Education of the possibility of increased financial aid to the authorities and a more generous allocation of building permits.
- (iii) The establishment of a national body with the title 'Royal College of Technologists'."

The group might usefully discuss (i). It would probably not discuss (ii), though it would no doubt be in agreement. The title in (iii) was reached after a lot of argument, presumably by a process of elimination, not necessarily as being the best but as the least offensive title in the view of the various bodies consulted.

The next recommendation concerned the functions of the Royal College:—

"... the Royal College should

- (i) approve suitable courses of advanced technology submitted by technical colleges under conditions appropriate to first and higher awards;
- (ii) approve the appointment of suitable external examiners to assist the colleges in setting and marking their own examinations".

This point might be worth considering from the point of view of the professional institution, which would almost inevitably accept these awards as exempting qualifications for the whole or part of its own examinations.

Then there were recommendations as to the constitution of the organisation; they provided for a court, a council and an academic board which should be appointed by the court and should include persons from the teaching staffs of technical colleges and universities (the order should be noted), and persons experienced in educational matters chosen from among professional institutions and industry.

Lastly, there were numerous suggestions concerning the title of the awards to be made which had been received from the various bodies, followed by the recommendation:—

"We therefore recommend the third alternative, i.e., an Associateship for the first award, Membership for the second award, and Fellowships and Honorary Fellowships for those who further distinguish themselves in the field of technological education and research".

This constituted a summary of the Report presented by the National Advisory Council. Everyone would, he thought, agree that there was a need for the training. Industrialists were constantly crying out for more and more trained technologists, and incidentally more and more trained technicians, but that was not under discussion for the moment.

The second point that struck him as worthy of consideration was Section 18, which discussed the further development of high level courses of various kinds based on a sufficient scientific foundation and conducted under conditions allowing the greatest possible freedom for experiment on the part of the teacher and for research on the part of students and staff. It also referred to the need for a radical improvement in the finance, staffing, equipment and accommodation of the colleges. There would be little quarrel with that. Next came the establishment of a new award and the establishment of a national educational body of high standing to approve and moderate the courses. There was a question the answer to which was, "By their fruits ye shall know them". No body, however formed or however supported, would be accepted as of high standing until such time as the men it had trained had been received into industry and tested; once they had been tried out in industry, as had those trained under existing courses, and proved to be of the high quality desired, acceptance of the proposals of the National Advisory Council would be assured.

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Section 19 read:—

“Whilst the four requirements specified above are in a real sense interdependent parts of a co-ordinated scheme and should be dealt with concurrently, the need to establish courses and conditions of a high standard in the colleges is so fundamental to the future development of higher technological education that, unless it is met, consideration of other requirements becomes quite irrelevant”.

That seemed to suggest that such courses did not exist at present; with due humility, however, he would suggest that that was not quite true. There were a number of colleges conducting courses very similar to those suggested and with the same kind of background; the results achieved were of a very high standard. The various professional engineering institutions, for example, had their own examinations which had partaken of that form and which aimed at a high standard. He would like to stress, however, that none of these courses could in themselves produce technologists; there must necessarily be industrial experience also. The suggestion for a closer link between the technological colleges and industry was therefore a very sound one.

The essence of the Report was in Part III, which began on page 16 and ended on page 19.

MR. T. A. BENNETT (Member) said that although he had listened very carefully to the Chairman's remarks in opening the discussion, he still had no clear picture of the intention of the National Advisory Council.

He would like information on the minimum standard for entry to the proposed courses and what would be the age of the students when they started; if they were to have had industrial experience, as well as a sound technical training, they would have reached an age when the students as well as the colleges would require financial assistance if a sufficient number of students were to be obtained.

The CHAIRMAN said that he could not pretend to understand completely the workings of the minds of the members of regional committees or the National Advisory Council. The minimum starting point would probably be something of the order of the present National Certificate plus additional general subjects. In other words, the standard would be comparable to the intermediate science examination but less fundamentally scientific in the pure sense. Here, he thought, things became somewhat hazy. The suggestions of the Council were partly embodied in Section 21 of the Report, which said:—

“What is required is the development of courses, mainly but not exclusively on a full-time or ‘sandwich’ basis, which combine a practical industrial approach with a greater element of broad fundamental science than is normally found in many existing courses. The standard of entry should be comparable to that of a faculty of science or technology in a university, and should make special provision for students recruited from industry. The length of the course should also be comparable, and there should be adequate provision for suitable work experience. The important feature is that the courses should be planned by the teachers concerned to provide the maximum adaptability to new conditions and techniques. This is desirable even in a well established technology such as engineering, and still more so in the other technologies . . . in which it is essential that new standards should be developed. In short, whilst the standards must be high, the content must be flexible”.

The age would therefore be about seventeen or eighteen.

MR. R. S. HOGG (Member) pointed out that there was no suggestion of establishing a central college which students would attend in order to acquire the very high standard contemplated. The idea seemed to be that the existing colleges

should continue to function, but should introduce a curriculum which would receive the approval of the Royal College of Technologists. Having received its approval, the colleges would proceed to train men of a high scientific quality, at the same time giving them the utmost possible facilities to acquire practical experience. At the end, they would be awarded certificates comparable with university degrees.

The curriculum would be drawn up in consultation with and with the approval of the central body, who would also review the results of the examinations. Presumably the colleges must also be open to inspection by the aforesaid body. At the same time, they were to carry on the existing courses for Higher National Certificate and other awards. The central body would not, however, regard the Higher National Certificate as a sufficient qualification. Something higher than that was intended, both scientifically and practically—a very high ideal indeed.

There was one other point that should be made clear. The training would be highly sectionalized. There would be in London, one hoped, a College of Marine Engineering recognized by the Royal College of Technologists, and similar colleges in Lancashire for the textile industry.

He hoped members followed his point. It seemed that the existing scheme of colleges would continue, but in a sense the colleges would surrender their present loyalties and hand them over to the proposed Royal College. If that was a misinterpretation of the situation, perhaps the Chairman would put him right.

MR. D. M. REID (Member) said that he had been concerned with training for marine engineering for a year or two, and the present position was that there were several departments of marine engineering attached to technical colleges throughout the country; in many ways they were satisfactory, but in some ways they were not. For example, the department was sometimes a minor department of the technical college concerned, and one disadvantage of that was that in some cases all grades of marine engineers were together in one room. The instructor had to try to give instruction to them all at the same time, and obviously he could not lecture to them but had to deal with them individually. This was most unsatisfactory. Individual tuition was a very good thing but lectures were also needed. Another disadvantage was that classes could become very large.

Marine engineers must be fitted into the scheme somewhere, and he hoped the following suggestions would not be thought too revolutionary. There should, in his opinion, be one college for the training of marine engineers from the time they went to sea. Entry to the college should require some eighteen months' sea service plus some technical education, preferably up to National Certificate standard. There should be, say, three courses in the college of six months each, the first—possibly widened a little—leading to what was now the second class certificate, the second to the first class certificate, and the third to the extra first class certificate.

There were one or two special points which he would like to suggest. First, the National Certificate should not exempt the student from Part A, because if that were allowed it would mean that a lad would finish his fundamental training in, for instance, heat engines and mechanics at eighteen or nineteen, go to sea and take his certificate, and do no more on these subjects at all. If entry to the college was of National Certificate standard, the standard of the courses could be raised, particularly in the case of heat engines and mechanics, which seemed to him to be very important subjects from the marine engineering point of view.

He realized that the question was fraught with difficulties of all kinds, and he had no doubt that there would be many criticisms of these suggestions. Whatever certificates were granted should, however, be recognized by the Ministry of Education and the examining body should consist, among others, of officials from the Ministry of Education and the Ministry of Transport—the Ministry of Education so that the certificates should be recognized by that body, and the Minis-

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try of Transport so that engineering knowledge and safety were properly allowed for.

Finance, he believed, had given a lot of trouble. He suggested that this should be by direct grant. After all, the Merchant Navy was surely of sufficient importance for the training of its marine engineers to be borne by the ratepayers as a whole, not by regions where the colleges happened to have marine departments. The technical colleges conferred great benefits on shore-based industry and the ratepayers paid for the training given for shore-based industry. Surely it was not too much to ask that the cost of training engineers for the merchant service should be borne by the country as a whole.

He thought members of the Institute should be on the governing body of the college and that they should arrange frequent lectures by specialists in marine engineering, particularly on engineering knowledge subjects, as well as other marine engineering problems. The Institute should also formulate a definite policy of training along the lines he had just suggested and should strongly recommend this policy to the Ministry of Education and the Ministry of Transport. This should be done at once and not after the present position had stabilized, when it would be very difficult to make alterations.

The CHAIRMAN asked whether Mr. Reid visualized the College of Marine Engineering as a national college in the same sense as the existing national colleges for heating and ventilating, rubber technology and aeronautics. If so, would it operate under the ægis of the body which was not a college but which was entitled "Royal College of Technologists"?

MR. REID said that he did not profess to know very much about the new scheme. He had read some of the pamphlets and they had baffled him completely. It did seem to him, however, that the college of marine engineering should be recognized by the Royal College. He did not see how the training of marine engineers could be fitted into the other colleges, because marine engineers went to sea when they were twenty-one, and therefore they could not follow the usual courses in higher technical subjects. Nevertheless, they should not be debarred from eventually reaching the high standard that had been suggested and they should therefore have their own special college. The highest grade in that college should be recognized as being of degree status.

The CHAIRMAN said that the impact of the Report on marine engineering was undoubtedly relevant to the discussion.

MR. P. F. HARROP said that although he was not a member of the Institute, he hoped he might be permitted to speak.

The CHAIRMAN: Certainly.

MR. P. F. HARROP said that although he was not of the much-discussed technical colleges and would like to explain his point of view. He had been very much disturbed by the reference to a surrender of loyalties. He would be very much opposed to any scheme which even suggested the surrender of present loyalties, because he had great faith in all sides of technical college work. The colleges had done some excellent work, particularly in connexion with national certificates. These certificates were widely known throughout the country and colleges had direct contact with industry. The national certificate courses were by no means purely academic.

With regard to research, recent experience suggested that Ministry inspectors were genuinely interested, and their support went a long way towards the final decision as to whether money should be spent on equipment for research.

Finally, he would implore the Institute to support the scheme for a Royal College of Technologists. Its qualification would eventually become of very high value indeed. All students could not be expected to reach this standard and therefore National Certificate courses should continue. At the same

time, there were great possibilities in a really high qualification from a Royal College. He hoped that that body, if formed, would see that its award was of a very high standard, and that close and direct contact with industry would be maintained.

MR. J. T. RONCA, who said that he spoke personally and not as President of the Institute of Fuel, agreed with the Chairman as to the need for defining terms such as "technician", "technologist", "applied scientist" and "craftsman". He wholeheartedly supported the Chairman's suggestion that a technician was a craftsman. As far as he was aware, the word "technician" originally came into something approaching common use in that wonderful industry, the film industry. Any man or woman who was not an actor was a technician. Now he was going to be cynical! Why was he or she a technician? Because "technician" sounded so much better to some people and "craftsman" was too honest and decent a word to use and did not suggest something wonderful and extremely new.

MR. HOGG: Well said!

MR. RONCA, continuing, said "technologist" was a fine word: any word ending in "ology" must be a fine word! But what was the difference between a technologist and an applied scientist?

A MEMBER: None.

MR. RONCA said the intention presumably was not to build a huge building to be used as a school of technology. The Royal College was going to "moderate" all the colleges over the country. Another wonderful word! He did not know precisely what it meant but it would no doubt, in the long run, involve some hard pressure. Be that as it may, there was to be a qualification, and the whole way through the Report it was stressed that the qualification would have prestige comparable with the qualifications given by the universities. The implication seemed to be that this prestige would be plucked out of the air just as a D.D.T. caught flies (or other horrors). He entirely agreed with the Chairman that there would be no prestige until it had been earned. Let them assume for the sake of argument that the qualification would be noted by means of some letters—say D.T.! But what on earth was the good of that to an industrialist looking for a technologist?

There were at least two kinds of technologists whom the industrialist wanted. First, he wanted men who could carry out a process—and he might want dozens of them—scientifically qualified men who could do a straightforward job demanding the application of science. Secondly, he wanted men who would devote themselves to ascertaining and dealing with the real problems of the factory—but he wanted fewer of these; he wanted two or three of the very best. The letters "D.T." would tell the potential employer nothing at all. If words were to be added by "moderating", such as D.T. "Marine Engineering", or "Institute of Fuel", or "Biochemistry" or "Entomology", what was going to be the difference between the combined "moderated" degree and the qualifications already issued by the various institutions such as the Institute of Marine Engineers, the Mechanicals, the Civils, the Electricals, and all the rest?

Apart from that, whatever was done would cost a lot of money. Even a single building would cost money and if the existing facilities were extended more apparatus and perhaps more buildings would be required. He had been in one institution recently which had the money but could not get a building permit for bricks, mortar, iron and steel. If money was to be spent, could it not be spent much more economically by extending, where suitable, existing facilities? Money was very "short" and it should certainly be spent in the most economical manner possible.

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To come to more selfish considerations, was it likely that the existing professional institutions—the chartered bodies—were going to sit down calmly without any opposition to the granting of a charter to a body which would confer omnibus qualifications, especially when so much stress was laid on the word “practical”? There was to be not only a theoretical training but a practical training. Again, the word needed defining. Those who had been to technical schools had taken a “practical course”, and what did it mean? It meant working in the laboratory at heat transfer or the calorific value of fuel or the analysis of fuel, or what not. These were all “practical” courses, but they did not make technologists. If one took a course in analytical chemistry one had done well if, in the practical course at college, one had estimated in a day one iron and one alumina. This did not represent the “practical experience” of industry demanded of a technologist. At a cement works one would carry out four analyses each involving an estimation of silica, lime, iron, alumina, magnesia, sulphate, and so on all in a day, and all wanted before four o’clock. He did not see how the ordinary technical college could ever give a diploma certifying “practical” experience from the point of view of the industrialist and of the technologist; that was to say, practical experience in a works run by some poor devil of a director who had to show a balance sheet on the right side. At college, operating costs were practically never mentioned.

MR. I. S. B. WILSON (Member) said he thought he could make an unbiassed contribution to the discussion because he had not seen at least three-quarters of the pamphlets referred to by the Chairman. He would like, however, to find out what was the aim of this new system of further education. It was often said that the Americans, or the Germans before the war, took over an idea from this country and developed it; that had happened in many spheres. Why did it happen? To his mind this country had a fair share of top brains—of the greatest men, the men who could take old principles and apply them to new ideas, but they had no one behind them to further their discoveries and put them into practice. During the war radar was pioneered in this country and shortly afterwards—and here he was not speaking of facts but he believed he was right—it was given to the Americans who then operated it in tropical climates far more efficiently than the British model. That meant that although this country had the greatest brain, which produced radar, the advantage could not be sustained because there were not enough men in the next grade down. Was the new further education going to fill the gap?

From the Chairman’s remarks, he gathered that the aim would be, for instance, to offer facilities and money grants to students who had obtained their higher national certificate and had proved their worth, so as to encourage them to reach a still higher standard. He was not sure whether that would fill the gap properly. One started with S.1 as a fairly large class, but slowly it went down until in the fifth year only a few of the best men remained. Would it not be better to try to keep that large class throughout? The man who reached the fifth year was, after all, a good man in his own subject; he was useful to industry in his own particular job. He was a conscientious man and he had initiative to do his work and look a little farther ahead. He would like to have the Chairman’s views on whether it would not be better to concentrate on the aspect that he had mentioned.

MR. RONCA said that in general he agreed that many men were wanted who were better craftsmen and technicians, men with reasonably good qualifications. No doubt the best ones would get out of the rut and go to one of the recognized universities or technical colleges, afterwards returning to industry.

He did not altogether agree with the statement that the Germans had made a success of ideas invented in this country because we have so few technologists. Perhaps the speaker was thinking of synthetic dyes. Why did the Americans make

a success of penicillin, work on which was started in this country? He did not think it was primarily due to the lack of technologists here. In Germany before the war the banks had one feature which was different from anything characterizing banks in this country. They had some directors on their boards who were so disreputable as to be technologists! The board did not have to scratch their heads when a problem came before it. They could take the advice of the technologists and because of this, new developments in industry were viewed more favourably in Germany than in this country. He was not alone in holding this view; Sir Charles Parsons, whose name would be revered by many of those present, had made the same comment on many occasions.

The Americans had, he thought, a stronger gambling spirit, and the industrialist in America was more ready to “take a chance”. He had greater facilities, of course, in some ways, for taking a chance; this did not necessarily mean that the British system was totally wrong. The fact that our banking system was so solid and so sure had had much to do with keeping our end up after the first world war. It was for technologists who had practical experience to indicate means whereby those who held the purse strings could have their attention directed to the potentialities of new projects.

MR. W. SAMPSON (Member of Council) said that in the presence of so many educationists he felt like the boy at the bottom of the class. He had read the Report mainly in order to see how it would affect those in industry who needed the services of technologists—though the latter were sometimes called by other names. Being interested in marine engineering, he had considered how it would affect the Institute. He had a horrible suspicion that the Royal College of Technologists, with its Court and Council would, to their sorrow, end by saying, “Your National Certificate or Chief Engineer’s Certificate or Extra Chief’s Certificate is all you need to be a marine engineer”. He would like Mr. Reid’s scheme to come to fruition, but he very much feared that the higher educational authorities would not help much unless the Institute got busy at once and told them what ought to be done. He did not know what was the next step—the Chairman was more expert in these matters than he.

A shining example of the kind of college Mr. Reid had in mind was the Massachusetts Institute of Technology. The West of Scotland had a marvellous college, as members would know; many of them had been there. People had come to him only the other day with four letters after their names as Associates of the Royal Technical College of Glasgow. This qualification was becoming well known, because it meant that a man had specialized in some branch or other; there had been some marvellous technologists from the College. Industry would have to test the value of this new qualification in order to prove its worth. In his humble opinion, if men were carried to the standard of the Higher National Certificate or of Associate Membership of the Institute, industry could make sure they developed a special knowledge of technology particularly suitable to the industry concerned, and he did not think any syllabus drawn up by a new body could lay down the requirements for a specialist technologist such as industry demands.

MR. J. G. DALLIMORE said he had three rather disconnected points to make.

First, was there a need for this higher standard? Surely the particular profession or industry would call for it if it were needed; it could not be imposed from above or by some independent body. If engineers of a higher standard were required, the profession would call for them and somehow they would be trained. If the scheme aided that development it would be a success.

Secondly, Higher National Certificate men were very good men but everyone was aware of the gaps in their education; it was not so much that they needed to go further as that the gaps should be filled. This could not be done in five years with seven and a half hours a week for evening students.

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In other words, more time was necessary, and that meant a longer course, or at any rate a longer time for study.

Thirdly, it had been asked what this qualification from the Royal College would mean to an industrialist. It had been said—and perhaps the Chairman would comment on this—that there were already, in this country, two or three colleges that approached the idea of the Royal College. He had particularly in mind the Manchester College of Technology and the City and Guilds Engineering College.

COM'R(E) J. I. T. GREEN, R.N. (Associate Member) asked why the name of the proposed new body should not be "The Royal College of Engineers"?

The CHAIRMAN said the title proposed was "The Royal College of Technologists", as would be seen from the Report. The object of the discussion was to consider the effect of the Report and its recommendations on the engineering associations, with special reference to their impact on the Institute of Marine Engineers.

MR. W. LAWS said that he understood that the Royal College of Technologists could cover every technology in the country and not only engineering.

SEVERAL MEMBERS: Yes!

MR. LAWS said that it had occurred to him that the governing body of such a college would have a dreadful headache trying to equate the claims for recognition of various technologies. As everyone was aware, housing was badly needed; he presumed that there was a technology of making bricks though he did not know anything about it. Suppose one had a first class man at making bricks who, because of his wide knowledge of the technology of brick-making, could produce more and better bricks in less time than the next man and was, therefore, a most valuable member of the community. How could one equate the claims of such a man to those of an Honours Graduate in Engineering capable of coping with problems using the calculus and so on, and yet presumably both might carry the same letters after their names indicating their status in the Royal College of Technologists.

A MEMBER: Moderate him!

MR. LAWS said that he could give many other examples but he presumed that others had already thought of them.

The CHAIRMAN said that the answer, as far as the Report was concerned, was that the organization should be governed by a President appointed by the Crown and a Court of Governors which should be finally responsible for general policy, the maintenance of high standards of attainment and the conferment of awards, assisted by an Academic Board and a Council, to which two bodies should stand referred all matters concerned with the approval of courses and the standard of awards. The Academic Board would have to determine which colleges, having submitted schemes, should be accepted. According to sub-section (5) on page 18:

"The *Academic Board* shall be appointed by the *Court*, and shall include persons from the teaching staffs of technical colleges (which might raise difficulties as particular schemes came up for consideration) and universities, and persons experienced in educational matters chosen from among the professional institutions and industry, the numbers to be decided by the Court of Governors".

Of the Council the Report said:

"... in the case of the Council all matters concerned with finance, administration, co-ordination of provision of courses to meet industrial needs and such educational matters in the field of technology, not being connected directly with approval of courses

and the standard of awards, as may be deemed appropriate".

Further down on the same page it was stated that:

"The *Council* shall be appointed by the *Court*, and shall include persons nominated by universities, technical colleges, employers and employees in industry, professional institutions, and local authorities, the numbers to be decided by the Court of Governors".

That was the proposed set-up of the Council and the Academic Board, the two bodies which would presumably provide the working apparatus, apart from the Court.

How far the discussion had been concerned primarily with the Institute of Marine Engineers he was not sure, but it had been quite a useful discussion.

MR. R. PATTISON said that the Royal College was not only a moderating body concerned with examinations and standards. It would be well to remember its origin; it had started because of the need for qualified technologists and facilities for training them. The Report dealt with the organization at great length, and it was clear that the idea was not only to set standards but to encourage the establishment of suitable courses.

What was the present position? There were very few courses such as those provided at the Glasgow and Manchester Colleges of Technology. The reason why colleges such as these existed at all was simple. At a certain period in their history they had had men interested in them who were willing to finance them and to force the local authorities to provide funds. Higher technological education depended ultimately on the rates, and developments had often been hamstrung for this very reason. A national body would be in a position to bring pressure to bear as in the case of the salaries of technical teachers.

With regard to standards, the Institutions of Mechanical and Electrical Engineers and the Institute of Marine Engineers had all raised their standards and broadened the scope of their syllabuses. Indeed, they had done so to such an extent that a young man was no longer able to acquire the technical qualifications required for associate membership on a part-time basis by the age of twenty-one, if he had, as was usually the case, started work at sixteen and studied in the evening.

It had been realized that a much broader training was necessary, and the National Advisory Council had felt that the only solution was to train technologists at least for two or three years on a full-time basis. He hoped that the Institute of Marine Engineers, with the other institutions, would stress that more and more people should be given these facilities. The organization was there, and it was not just a moderating organization giving approval to courses but also a piece of machinery for the encouragement of suitable courses.

MR. T. W. LONGMUIR said that in regard to possible repercussions which the establishment of the Royal College of Technology might have on the Institute, he considered it would have little effect.

Those who came in contact with the young engineer up to the age of twenty-one, could pick out in any one year three or four students who would derive benefit from using the Higher National Certificate as a starting point for deeper and broader as well as higher training in technology.

The majority of those with a Higher National Certificate did not stay at sea longer than five years, especially if they obtained a Ministry of Transport Extra First Class Certificate; they then entered the marine engineering industry ashore. If, however, they received a further three years full time education at the age of twenty-one, he doubted if they would ever go to sea but would enter the industry without the benefit of sea-going experience; the men at sea would lose through not coming into contact with men of higher technical qualifications.

Reference had been made by previous speakers to a connexion between a Ministry of Transport Certificate of Competency and a Higher National Certificate in Mechanical

## The Future Development of Higher Technological Education

Engineering; personally he could not see any connexion. A Ministry of Transport Certificate was an end in itself whereas everyone connected with the National Certificate scheme regarded it as a starting point; it stimulated a desire for greater knowledge, or so one hoped.

MR. HOGG said that it might be appropriate to read to the meeting the letter sent by the Institute to the Ministry of Education with regard to the draft Report of the National Advisory Council.

It read as follows:—

Sir,

### *The Future Development of Higher Technological Education*

The Council of this Institute met on Monday, 5th February 1951, and reviewed the recent report of the National Advisory Council on Education for Industry and Commerce on "The Future Development of Higher Technological Education". In accordance with the invitation contained in your foreword I have been instructed to submit to you my Council's comments on this report.

Whilst my Council are generally in sympathy with the views expressed in the report, and whilst they fully appreciate the importance of setting up a national body to review and approve courses in technical colleges and to moderate examinations in such a manner that the awards so made may be accepted widely as being of equal standard to a first University degree, they feel that emphasis should be laid upon paragraph 44 of the report and that the functions of this new national body should be so limited.

My Council do not agree with the proposed title of "The Royal College of Technologists" and consider it conflicts with the opening sentence of paragraph 44.

It is emphasized in the report that the adoption of titles for the new awards should not in any way duplicate the titles of those awards already being made by the Universities or Professional Institutions. In this connexion the use of the title "Member" is strongly deprecated.

The Institute of Marine Engineers is most concerned with the effects that the proposed scheme will have upon the training of potential future marine engineers and it must be pointed out in this connexion that my Council accepts as a qualification for Corporate Membership of this Institute the Ministry of Transport's First Class Certificate of Competency. It is felt that the Corporate Membership of a specialized institute such as the Institute of Marine Engineers is valued more by those concerned than any qualification obtained from a generalized body such as the proposed Royal College of Technologists.

With regard to the constitution of a body whose duty it is to moderate courses and examinations my Council strongly recommend that such a body should be composed solely of persons of academic and, or alternatively, professional standing. Marine engineering is a highly individual branch of the profession and my Council consider it important that any body controlling the training of marine engineers should include a sufficient number of members with personal experience of, and sufficient eminence in, the profession.

I am, Sir,

Your obedient Servant,  
B. C. CURLING,  
*Secretary.*

DR. F. HEATHCOAT said that a good deal of criticism of the proposed Royal College had been expressed—no doubt rightly, because it was open to criticism. Perhaps, however, he might be allowed to say a word in its defence.

It should be remembered, as Mr. Pattison had pointed out, how the idea had originated. During and after the war, it was realized that there was a need for many more highly trained technologists, and the question was asked, "Can the univer-

sities alone provide such people?" The answer was, he thought, "No!" That brought the technical colleges into the picture, and it would be generally agreed, he thought, that the technical colleges had done a very good job of work, but they had been working under very great difficulties. The National Certificate scheme, for example, was a very excellent scheme, but it did not go far enough. Could one get a broadly trained engineer by the part-time course as laid down in the Higher National Certificate scheme? One obtained a very good man, and the great advantage was that he had had the industrial experience. He might even be a better type of engineer than the graduate from the university who emerged after three years with no practical experience of industry. However, something should be added to the National Certificate scheme, and the new scheme was an attempt to do so.

In engineering the qualification for entry to the course would probably be the Ordinary National Certificate plus, say, chemistry and physics and English up to the standard required by the Institution of Mechanical Engineers for Part I of their Associate Membership Examination. When a young man had been in industry for two or three years, he had a background of experience—not a very broad one, but something on which to base his later studies. He would then take the "sandwich" course of three years, i.e., six months at a technical college and six months in industry in each year and obtain his first award. He would be a better trained engineer than the "theoretical" engineer who came out of the university without industrial experience.

If he might speak of his own subject, chemistry, he was not entirely satisfied that the universities were producing the best type of chemist. He was speaking here of the majority of universities concerned with the training of the pure chemist. He himself had been trained as a pure chemist and he had imagined when he graduated that he was a well trained chemist, but in the light of experience he had realized how inadequate his training was. He had had to acquire a knowledge of fuel technology and he had afterwards become a member of the Institute of Fuel. Metallurgy was hardly touched upon in a pure science course. He could visualize a type of training whereby a good deal of the theoretical organic chemistry, for example, was dropped. Unless a man was to be trained specifically to be an organic chemist and to go into industry as such, he read far more organic chemistry at the university than he actually required. He should be given a broad training in the fundamentals and then go on to such subjects as fuel technology, chemical engineering, a certain amount of metallurgy to enable him to understand the properties and structures of metals, and other branches of industrial chemistry. These matters were largely omitted in a university course in chemistry.

It would be possible for a technical college to develop courses of that kind in applied chemistry and the student would then be eligible for the proposed award.

In physics, the subject of electronics was very important nowadays, and it would be possible to devise a course in applied physics with the emphasis on electronics.

As he saw it, the scheme was not intended to displace anything valuable which already existed but to supplement other courses. There were still many branches of technology that were not well provided for as yet, such as plastics. Fuel technology was only taught in a very few universities.

MR. RONCA: Very few.

DR. HEATHCOAT said he felt sure the Institute of Fuel would welcome more centres for the training of fuel technologists.

MR. RONCA agreed.

DR. HEATHCOAT said that it should be emphasized that the proposed body would not be a professional body in the same sense as the recognized professional institutions. It would be a body for the awarding of qualifications, the value of which

## The Future Development of Higher Technological Education

would naturally have to be tested by the products. The people responsible for setting it up would undoubtedly exercise the greatest care in selecting the Academic Boards.

"Moderation" was essential if the qualifications were to be of national standard. This was quite normal; it happened in university examinations. A university would invite a professor from another university to moderate. It was also part of the National Certificate examinations. He did not see why anyone should criticize the idea of moderating the examinations of the proposed Royal College.

MR. REID asked what the last speaker meant by "not a professional body".

DR. HEATHCOAT said the Royal College would not be a professional body in the same sense as the Institute of Fuel or the Institute of Chemistry, for example, at which papers were read and meetings held. There was no suggestion, as far as he could see, that the Royal College should hold meetings and read papers as was done by the professional institutions.

MR. REID said that reading papers and holding meetings did not make it a professional body.

DR. HEATHCOAT said he agreed, but that this was one of the functions of a professional body.

The CHAIRMAN drew attention to Section 44 of the Report:

"Thus it will be seen that the national body which we propose partakes neither of the nature of a professional institution nor of an external examining body. Its awards will not confer a professional qualification, but will be designed at the first level to provide an educational qualification comparable in value to a university degree and at the second level a qualification attainable after an advanced course of post-graduate study and/or research in a phase of technology. It will neither conduct examinations nor set syllabuses, but will approve the principal conditions for examinations conducted by the colleges, and, having regard to the necessity for flexibility and experiment, moderate syllabuses and technical arrangements so that a high general standard is assured".

That was the avowed intent of the proposed Royal College of Technologists.

MR. B. C. CURLING said that the remarks of Mr. Reid and Mr. Longmuir suggested to him that a prototype of what the proposed college would do might be seen in the Admiralty course of training for Engineer Officers of the Royal Navy. These officers received a first class training for four years at the Royal Naval Engineering College, Keyham. The cream of these engineers were, he understood, afterwards selected for what was known as the "Dagger" course, a super-training at

the Royal Naval College, Greenwich. Unless he was mistaken, a similar super-training was precisely what the proposed scheme aimed at providing in industry.

The CHAIRMAN, summing up the discussion, said it seemed to be agreed generally that there was a dearth of people satisfactorily trained in technical knowledge, even in the engineering profession. Anyone who was connected with a technical college would know perfectly well how difficult it had been to get lecturing staff and how conditions had forced them to accept people who had not had as much training as might have been wished. Industry, too, was bemoaning the lack of people with the appropriate training.

This immediately led to the necessity for further provision to amplify the training that already existed—to spread it a little broader for some people—and Mr. Curling's remarks as to the similarity between the naval engineering courses and the courses contemplated for other technologists were apt. The courses were of university standard but different in content and less attention was paid (he stood to be corrected by Commander Green) to pure science. More attention was paid to the application of science in a particular direction.

The question had been raised of the relationship of the new proposals to the Ministry of Transport award of certificates of competency. He did not think the latter would be affected. He did not think the Ministry of Transport would allow them to be affected. The Ministry of Transport was concerned with another aspect of training. The Royal College would be concerned only with the standard of technology but the Ministry was concerned with something more.

The provision of financial assistance had been considered. There was no question of the Royal College providing funds. That had been suggested as a means of coercing the individual authority or whatever it might be to give more money, either by direct or indirect grant, to the technological colleges. Without question, the money would come from the ratepayers or the taxpayers in the end. The colleges would be colleges of the local authorities, recognized not necessarily for all but for certain purposes, much as some departments but not others were now recognized for university purposes.

While there seemed to be agreement as to the need for more trained men and for training facilities, however, there was doubt and disagreement as to some of the modes of operation. As far as the Institute of Marine Engineers was concerned, there was the possibility of a technologist somewhat different from those existing at the moment. He was not sure, however, that he was wholeheartedly in agreement with the idea that a man could be a good marine engineering designer without having been to sea. It might be possible, but he was not so sure.

To summarize, there was general agreement as to the dearth of trained men and the need to do something about it. There was agreement that the Report contained suggestions about what should be done but not that it necessarily contained the best suggestions. He had found the discussion very interesting as, he hoped, had everyone else.



## INSTITUTE ACTIVITIES

### PARSONS MEMORIAL LECTURE

#### MINUTES OF PROCEEDINGS OF THE MEETING HELD AT THE INSTITUTE ON TUESDAY, 22ND MAY 1951

A special meeting was held at the Institute on Tuesday, 22nd May 1951, at 5.30 p.m., for the presentation of the 1950 Parsons Memorial Lecture.

MR. J. TURNBULL, O.B.E. (Chairman of Council), opening the meeting, said that it was his pleasant duty formally to induct Dr. S. F. Dorey, C.B.E., F.R.S., as the new President, and to invite him to take the Chair. As members were aware, owing to his unfortunate absence due to illness, Dr. Dorey's installation by the outgoing President, Sir Murray Stephen, could not be carried out at the Annual General Meeting on the 2nd April last.

In welcoming Dr. Dorey now, and although he did not need any introduction to members of the Institute, there might be a few young members present to whom his achievements might not be so well known. Dr. Dorey had held his present position of Chief Engineer Surveyor of Lloyd's Register of Shipping for the past twenty years. He was a Commander of the Most Excellent Order of the British Empire and a Fellow and Member of Council of the Royal Society, a rare distinction for an engineer in that august body. He was the Immediate Past President of the Institution of Mechanical Engineers. It was interesting to recall that among his many awards for papers which he had delivered before various societies, he had received the medal and premium for his Parsons Memorial Lecture, given under the auspices of the Institute in 1942. It would be possible to continue the recital of Dr. Dorey's achievements at considerable length, but he thought he had said enough to let members know that they had as their President one of the most distinguished engineers in this country. Apart from his professional attainments, Dr. Dorey had many fine personal qualities for which he was greatly admired by his colleagues, and of which he (Mr. Turnbull) had only become fully aware when he became closely associated with their President through the merging of Lloyd's Register of Shipping and the British Corporation. They were very grateful to Dr. Dorey for having agreed to accept office as their President. He was a marine engineer, with sea-going experience, who had risen during the course of twenty-five years from ordinary membership of the Institute to the Presidency, which, as they knew, was the highest honour which the Council could bestow. In conclusion, he felt sure that it was their wish to accord to Dr. Dorey a very hearty welcome and to wish him a very happy term of office.

DR. DOREY, on taking the Chair amid loud applause, thanked Mr. Turnbull for his kind remarks. He took this opportunity to apologize for his inability to be present for installation at the Annual General Meeting; he was very glad to be making his first appearance at the present meeting, at which such an important lecture was being delivered. It was a particular pleasure indeed to him to be elected as their President; seeing that the choice fell upon a marine engineer only once every three years, he felt it was a great honour which had been accorded to him.

Proceeding to the business of the meeting, he recalled that shortly after the death of Sir Charles Parsons it was decided

to perpetuate the memory of this great engineer in three ways, namely

- (1) an Annual Lecture in any of the subjects in which Parsons was interested,
- (2) a Parsons Memorial Library in London House, in connexion with the Dominion Students Hall, and
- (3) a Memorial in Westminster Abbey.

The Memorial Library was completed some years ago and the Memorial in Westminster, which took the form of a window portraying Sir Charles Parsons, was unveiled in October 1950, when members of the Council of this Institute were present. It might be a source of much gratification to the members to know that Parsons was referred to on this window as a marine engineer.

The Parsons Memorial Lecture was instituted in 1936, and the lecture they were to have that evening was the fifteenth of the series and the second to be given before the Institute.

There were three successive lectures in London to intercalate with the lecture every fourth year on the North East Coast, arranged by the following institutions representative of Sir Charles Parsons' work:

To commemorate his work in naval architecture and marine engineering:

The Institution of Naval Architects

The Institute of Marine Engineers

In recognition of his activities in civil, electrical and mechanical engineering:

The Institution of Civil Engineers

The Institution of Electrical Engineers

The Institution of Mechanical Engineers

and to represent his work in optics:

The Physical Society.

The Council of the Institute nominated Professor Burrill for this year's lecture. Professor Burrill received his early practical training with Messrs. Swan, Hunter and Wigham Richardson, Ltd., at their Wallsend shipyard, and concurrently studied at Armstrong College (now King's College), Newcastle-upon-Tyne, where he graduated as Bachelor of Science with Honours in Naval Architecture in 1927. He subsequently obtained an 1851 Exhibition Research Scholarship awarded through the Institution of Naval Architects, and after doing research work returned to Messrs. Swan, Hunter and Wigham Richardson, Ltd. In 1934 Professor Burrill joined the Manganese Bronze and Brass Company, Ltd., holding the position of naval architect to that company from 1936 until he became Professor of Naval Architecture at King's College, Durham University, five years ago. Professor Burrill was a Silver Medallist of the Institute, a Member of Council of the Institution of Naval Architects, and a Vice-president of the North East Coast Institution of Engineers and Shipbuilders.

He had much pleasure in asking Professor Burrill to deliver the Parsons Memorial Lecture.

At the conclusion of the lecture, the President said that Professor Burrill had added to their knowledge of Sir Charles Parsons and his work. Sir Charles Parsons had been a great engineer, a great Englishman and one worthy of the reputation among engineers internationally. The subject of this present lecture came within a sphere which was more particularly allied to naval architecture, but it indicated the foresight and great capabilities of this man, and he was sure that they would

## Obituary

agree that this lecture had been of the same high standard as previous Parsons Memorial Lectures. They had already signified in no uncertain manner their appreciation of the lecture, but he proposed that a hearty vote of thanks be accorded to Professor Burrill for his lecture, and he was sure that they would give it with acclamation.

The vote of thanks was carried with loud and prolonged applause.

Continuing, the President said that the arrangements for the Parsons Memorial Lecture, as with the other memorials to his name, had been in the hands of the Royal Society. The lecturer received a suitable honorarium and a commemorative bronze medal, the funds for these being invested in the name of the Royal Society. It was usual for the Royal Society to be represented at the lecture, and he had been asked by the Council of the Society to represent them on this occasion and present the Medal and Honorarium to the Lecturer, which he now had much pleasure in doing.

PROFESSOR BURRILL, in reply, said that he was very glad indeed that it was Dr. Dorey, a marine engineer and the author of one of the previous Parsons Memorial Lectures, who had handed to him this Medal bearing Sir Charles Parsons' head on the obverse side.

He was also pleased to see that Mr. K. C. Barnaby, the author of the preceding Parsons Memorial Lecture, was present. He thought that they would both agree with him that writing about Parsons was a comparatively easy task because Sir Charles had almost written the lectures for them. It had been an excellent experience for him (the author) as a young man to delve into these records of over fifty years ago and to discover that we were not much ahead of Parsons' work even today.

The meeting ended with the display of a slow motion film showing cavitation produced by a model of the *Bremen's* propeller and other types.

### MEMBERSHIP ELECTIONS

Elected 17th July 1951

#### MEMBERS

Edward John Allender  
Albert James Braithwaite  
Hari Khemsing Chhabria  
John Henry Coles  
John Dorrian  
Samuel George Duncan  
William Blethyn Edwards  
Constant Elsig  
Sydney Victor Fleck  
George Brownlie Heron  
William Edward Douglas Hull, Lt.-Com'r(E), R.N.  
Horace Aubrey Jarrett, Lt.-Com'r(E), M.B.E., R.N.

Peter McLachlan  
Frederick Thomas Morris  
Oswald Guy Spence Pacey  
Norman Charles Petrie  
George Filshie Lyle Rodger  
Douglas Leonard Smith  
James Allan Stevens  
Cedric Blunt Taylor

#### ASSOCIATE MEMBER

Philip Heslop Arthur

#### ASSOCIATES

Eric Claude Armstrong  
William Davenport Barrow  
Arthur Sheppard Bennett, M.B.E.  
Philip Augustus Cheesman  
John Dent  
Donald Alexander Gillies  
Dennis Hodgson  
Hamilton James Logan  
Angus Macdonald  
Timothy Patrick Murphy  
Kalarickel Kelen Narayanan  
Frank Allan Powell  
Bertram Thomas Revans, Lieut.(E), R.N.  
Peter Smith  
Joseph Frederick Stower  
Dennis Tunnah  
Jose Francis Viegas  
William Peter Walby  
Dennis Hinton White  
Thomas James Gorham Wright

#### GRADUATE

Sigbjorn Johan Birkeland, B.Sc.

#### PROBATIONER STUDENT

Brian John Hayter

#### TRANSFER FROM ASSOCIATE TO MEMBER

Leslie Archibald Goodyear  
Mark Harper  
Robert Alexander Robertson  
George Vitt  
John Williams

#### TRANSFER FROM ASSOCIATE TO ASSOCIATE MEMBER

Robert John Weeks

#### TRANSFER FROM STUDENT TO ASSOCIATE MEMBER

James Dudley East, Lieut.(E), R.N.  
Derek Graham Satow, Lieut.(E), R.N.

## OBITUARY

### MR. JOHN LEWIS LUCKENBACH

We deeply regret to record the death on 4th July 1951 at the age of sixty-seven, of John Lewis Luckenbach, Chairman of the Board of Managers of the American Bureau of Shipping, and Local Vice-President of the Institute at New York. He had been associated with the American Bureau of Shipping for the past twenty-four years, joining the organization in 1927 as Executive Vice-President. Following the death of Captain Charles A. McAllister in 1932, he became Acting President and

was elected President in 1933. He continued in this office until January 1950, when he was elected Chairman of the Board of Managers.

During Mr. Luckenbach's long period of association with the Bureau he was tireless in its interests, sponsoring many ideas for the advancement of ship classification work and improvements in the science of shipbuilding and design. He was instrumental in providing for the Bureau its home office in New York City. Entirely because of his planning, the office

## Obituary

building at 45 Broad Street was rehabilitated as the main world headquarters for the Bureau, with full laboratory facilities, technical departments and modern office space.

Mr. Luckenbach was born at Kingston, N.Y., on 19th November 1883, the son of Edward and Henrietta (Weber) Luckenbach. He graduated *cum laude* from Holbrooks Military Academy in 1902 and was in the class of 1906 at Princeton University. He also studied engineering in night courses at Pratt Institute, Brooklyn, N.Y. He married Kate Isobel McGregor of San Francisco on 26th January 1916.

After leaving Princeton, he joined the Luckenbach Steamship Company in New York. From 1912 to 1915 he was in charge of maintenance and repair of Luckenbach ships on the Pacific Coast. He returned to New York during 1915 to take



over the design and construction of new cargo ships for the Luckenbach Line. Then followed an interlude during which he participated in the Government's shipbuilding programme of the first World War. In this activity he was assigned by the United States Shipping Board to take charge for the Government of the construction of some thirty-five large cargo ships in Japan and four in China. He returned in 1920 and was elected Vice-President in charge of maintenance, repair and operation of the big fleet of cargo vessels operated in the inter-coastal trade by the Luckenbach Steamship Company. He served in this capacity until 1925, when he retired from the Company.

One of the original members of the Propeller Club of the United States, upon its formation in 1927, he had served on the Board of Governors for many years. Since 1936, he had been Chairman of the annual American Merchant Marine Conference sponsored by the Club.

Mr. Luckenbach was elected President in 1947 of the Board of Trustees of Webb Institute of Naval Architecture, Glen Cove, Long Island, N.Y. He was largely instrumental in the sale of the old school buildings in the Bronx, N.Y., and in securing the beautiful country estate upon which the school is now located.

During the two International Safety of Life at Sea Conferences held in London in 1937 and 1948, Mr. Luckenbach served as an official delegate of the United States Government. He was a delegate to the International Conference of Naval Architects and Marine Engineers held in London and the Engineering Congress at Glasgow in 1938. Mr. Luckenbach represented the American Bureau of Shipping at the First Congress of Classification Societies held in Rome in 1939.

A member of the Society of Naval Architects and Marine

Engineers since 1916, he had been active in the conduct of its affairs, submitting papers at its annual meetings, serving in various offices, including the Council, and at the time of his death was an Honorary Vice-President.

He was also a member of the American Society of Naval Engineers, the Institution of Naval Architects, the North East Coast Institution of Engineers and Shipbuilders and, as previously mentioned, a Vice-President of the Institute of Marine Engineers, which office he had held since 1939. His clubs included the New York Yacht Club, India House, and the Princeton Club.

GILBERT FILSHIE (Member 7748), born in 1903, served an apprenticeship with Cuming, Smith and Company and George Kelly and Lewis, both of Melbourne. He spent ten years at sea, obtaining a First Class Board of Trade (Steam) Certificate, and was then engaged as refrigerating engineer at Bermondsey Cold Stores. At the time of his election to membership in 1935, he was a mechanic at the Fulham Gas Works, in 1942 he was mechanical superintendent with the Gloucester Gas Light Company, and in 1945 he returned to the Merchant Navy for service at sea. Mr. Filshie died on the 25th March 1951.

COSTAS FRANGOS (Member 12153) was born in Greece in 1891. He served an apprenticeship with the Vassilittes Engineering Company, Piræus, from 1910-12 and for five years attended the Technical College in that port. He spent many years at sea and sailed for eleven years as second and chief engineer in Greek ships, obtaining a Greek First Class Steam Certificate in 1918. For some time he was superintendent engineer and director of the Syrios Steamship Company, but in 1948 he went into partnership with Mr. J. R. Douglas, with whom he was associated until his death on the 17th May 1951.

C. HUMPHREY GILBERT (Member 1372) died on the 30th April 1951, in his eighty-sixth year. He was born in Nottingham, educated at Nottingham High School and in France and Germany, afterwards gaining a Whitworth Scholarship which enabled him to study engineering at the Royal Naval College, Greenwich. At the early age of thirty he was appointed Inspector General of Machinery to the Chilean Navy and for the next ten years lived in Valparaiso. He was elected a Member of the Institute in 1899.

P. H. HUNTER (Member 2879) was born in 1875. He served an apprenticeship with J. and G. Thomson, Ltd., Clydebank, and after four years' sea service he obtained an Extra First Class B.o.T. Certificate. In 1914 he was appointed hull and engine surveyor for A. M. Gordon, who was naval architect to the Allan Line. He was for many years an engineer lieutenant commander in the Royal Naval Reserve, continuing to serve even after his retirement from business in 1939. Mr. Hunter was elected a Member in 1914.

THOMAS WELLS KIRBY (Member 12546) was born at Hobart in Tasmania in 1896 and educated there at the Hutchins School. From 1912-16 he served an engineering apprenticeship, first with F. Rowntree and Sons and then with Charles M. Foster, and during this time attended the Hobart Technical College. From 1916-18 he served with the Australian Garrison Artillery at Fort Nelson, Tasmania, and then abroad for three years in the 1st Australian Siege Battery and Australian Flying Corps. During 1921 and 1922 he worked as a fitter at Cockatoo Island Dockyard and with Metro-Vickers Electrical Co., Ltd.; from 1922-27 he sailed in the *Taiyuan* and *Changte*, owned by the China Navigation Co., Ltd., on service between China and Australia, and in 1926 obtained a First Class B.o.T. (Steam) Certificate. In 1927 Mr. Kirby joined the staff of the Shell Company of Australia, Ltd., first as marine representative and later as technical engineer assistant to the manager of the lubricants department, remaining with the company until his death on the 5th May 1951. Mr. Kirby was elected a Member of the Institute in 1949 and was an enthusiastic supporter of the Sydney Local Branch.