COMMEMORATION DAY.

The annual Commemoration of the University of Adelaide was held on Wednesday afternoon, December 19, in the Library of the University, and preceded by a very gratifying ceremony. Members of the Council and Senate assembled in the Museum wearing the academic costume proper to their respective degrees and offices, and walked in procession to the Library, followed by Professors Tate, Rennie, Ives, Bouler, and Bragg. The Chancellor (the Hon. S. J. Way) presided, and was attended on the platform by the Vice Chancellor (Archdeacon Farr) and the Registrar (Mr. J. W. Tyas). There was a crowded audience, fully half of whom were ladies. The front seats were occupied by their Excellencies the Governor and suite, Archbishop Reynolds, Sir Henry Ayers, the Chief Secretary, the Attorney-General and Mrs. Kingston, the Rev. A. Hankey, D.D., and Mr. Henry Lee.

ADMISSION TO DEGREES.

The Deans of the Faculties presented the candidates in their respective faculties to the Chancellor, who conferred degrees on the undernamed candidates:


B.Sc. Degree.—Clinton Coleridge Farr.

B.A. Degree.—The first candidate for this degree presented was Miss Charlotte Eliza Franks, who was loudly cheered on ascending the platform. The CHANCELLOR congratulated Miss Wright on being the first woman Bachelor of Arts in the University of Adelaide. (Cheers) She was not the first woman graduate in the University, but as the first woman Bachelor of Arts, he trusted she was the first of a long and illustrious line of bachelors of her sex under that Faculty. (Loud cheers.)

The other candidates on whom the degree of B.A. was conferred were:—Thomas Martin Burgess, Alexander Wyllie, Ernest Neville Marriat, George Alfred Bircher, Nicholas Le Mesurier, Judah Moses Solomon, Percy Norwood Knight, and Thomas Abram Le Mesurier. Addressing Mr. T. M. Burgess, the CHANCELLOR said he did not wonder at the applause which greeted his advance to the platform. The degree which he had taken had never been excelled in the history of that University. He had passed with first class honours in classics, and he had passed first class in honours in mathematics. At Oxford that would be called a double first class, and he (the Chancellor) did not know why such a distinction should not bear the same name in the University of Adelaide. (Hear, hear.) So soon after his undergraduate career there was no doubt only a precursor of an even greater success in after life? (Hear, hear.) The CHANCELLOR asked him to do his utmost for the cause of education and for the sake of the University of Adelaide.

The following graduates of other Universities were admitted ad eundem gradum:—Sir Samuel Davenport, LL.D., University of Cambridge; Sylvanus James Magarey, M.D., and others.

Sir Samuel Davenport, LL.D., University of Cambridge; Sylvanus James Magarey, M.D., and others.
The Dean of the Faculty of Arts presented to the Chancellor the John Howard Clark Scholar, Frank Sandiland Hone; and the Dean of the Faculty of Medicine presented the winners of Sir Thomas Elder's Prize, Rowland Cavenagh (student of medicine), and Matilda Beatrice Austin and Frederick Coleman (non-graduating students). The names of the successful candidates in the first classes of the Senior and Junior Public Examinations and of the senior division of the Public Examinations in Music were then read.

PROGRESS OF THE UNIVERSITY—Tribute to His Excellency

The Chancellor, Your Excellency, my Lord, ladies and gentlemen: As we have to listen to the annual oration by Professor Bragg, and possibly to a few observations from His Excellency, the Hon. the Chief Secretary, the Hon. the Attorney-General, His Grace the Archbishop, and our distinguished guests, Mr. H. T. Hannay and Mr. Henry Lee—as well as the other visitors who are present, within the walls of the University, and to thank them for the honour they have done us by attending on this occasion, Your Excellency, I am sorry that this is the last time we shall have the opportunity of welcoming you at the annual Commemoration—last year, in your capacity of Governor of South Australia. The first time you attended one of our Commemorations, was in December 1883, just five years ago. It is, I am sure, quite impossible for you to compare what you saw then with what we have witnessed here to-day, without being struck with the progress which has been made by the University of Adelaide during these five years. On the first of these occasions we admitted two of the students of the University to degrees. This year we have simply elevated the Faculty of Arts and a Faculty of Laws which had been established just twelve months before. Now, owing to the munificence of—
tent libe

rality of our benefactor, Sir

Thomas Elder (cheers)—and to the libe

rality of Mr. John Howard Angus, we have,

besides, a Faculty of Science, a Chair of

Chemistry, and a fully-equipped School of

Medicine. We have also a Professorship of

Music, and we have provision made for even-

ing lectures, the usefulness of which will be

much increased by the recent establishment

of a School of Mines and Industries in this

University. We had 47 graduating students.

We end this year with 716 graduating stu-

dents. And then, if we turn from the pro-

per teaching work of the Uni-

versity to what we are doing outside our own

classrooms in the way of examinations

—if we compare what we did then

with what we are doing now—I think it

must be admitted that the results are

equally satisfactory. In 1888 151 boys and

girls presented themselves for examination in

our matriculation and junior examinations. This

year we have admitted 526 candidates to the

examinations which have been held by the

University no fewer than 526 candidates, or,

if we include the candidates who presented

themselves at the popular examinations in

the theory and practice of music, then these

numbers reach 716. (Cheers.) I should

have to trespass too long on your time, and I

fear you would regard it as tedious if I were

to attempt to explain in detail the full signi-

ficance of these figures; but I think I may

claim to have shown that the University has

grown from a small beginning. In which I

boldly affirm, that within the last

five years there has been a great expansion

in every branch of the work of the University.

Your Excellency, like your predecessors,

the lamented Sir Anthony Musgrave,

who died last October, and like His

Excellency Sir William Jervois, has

ever since your arrival in the colony

taken a warm interest in the welfare of the

University. (Hear, hear.) You have

attended and taken a part in volun-

tary Campus activities. It is owing to

your suggestions, to your influence, and to

your exertions, that the University of Ade-

laide has the distinguished honour of being

the first University in Her Majesty’s Domi-

nions in which a teaching Chair of the science

of music has been established. (Cheers.) On

account of that benefit which you have

done to the University, it is a cause of

satisfaction to myself, and I am sure it is a

cause of great satisfaction to the mem-

bers and friends of the University, that our

generous friend Sir Edwin Smith has pre-

sented us with a portrait bust of your Excel-

lency, which will make familiar to all succes-

sive generations of students one who has not

only filled the high office of Governor of this

colony with loyalty to the Queen, and

with faithfulness to the people of South

Australia, but who has done a signal

service to this University. (Cheers.) I wish

your Excellency were to return to us long

after you are gone, because, as well as we know,

we should have your zealous co-operation in

securing the permanent endowment of the Chair

of Music. As I need not remind your Excel-

lency that Chair is supported by contributions

extending over five years which come to an end at the

close of next year. I am sure that your Excel-

lency will be gratified to know that the

interest and usefulness of the Chair are main-

tained, and quite answer the most sanguine

anticipations which we formed at its com-

 mencement. There have been all along about 20

graduating students. Further, at the exa

minations ...
tions, which, by a happy suggestion of Professor Ives, were established last year—the popular examinations in the theory and the practice of music—75 candidates presented themselves, then, while 194 candidates presented themselves this year, clearly showing that the step which was thus taken is having a very important influence on musical culture throughout South Australia. (Cheers.) I also wish to mention a fact which I know will be gratifying to the late Treasurer of the University, Sir Henry Ayers, the fact that the revenue of the Chair is advancing. (Hear, hear.) The fees received from students and candidates for examination during the year that has just closed, were nearly twice as large as they amounted to in any previous year, and amounted to £441. That sum is not sufficient to maintain the Chair, and it is therefore necessary, if we are to secure its permanent continuance, that it shall be endowed with some substantial amount. I confess that in my opinion the University of Adelaide is committed, and the colony of South Australia is committed, and unless we are able to preserve its prestige among our cities, it will fall from the front to the rear; unless we are prepared to say that the students of South Australia, if they desire to obtain degrees in music, are to go to Melbourne or Sydney, or to any part of the world in which they can find what they want, it will be necessary for us to take earnest steps during the ensuing year for the purpose of obtaining a permanent endowment of the Chair of Music. (Hear, hear.)

Your Excellency—As I have already said, we have to wish you farewell in your capacity as Governor to-day. I trust we shall see you in a few months when you are a permanent member of the University and to the public of South Australia on the marked success which has attended this University during the period I have been in the colony. I have listened with great gratification to the exposition given by the Chancellor of the work done in this University; and perhaps I may be pardoned for saying that none of his observations have been more agreeable to me than those which speak of the success of the Chair of Music. (Hear, hear.) I can bear personal testimony to the success of the Chair, under the able and learned guidance of a Professor who has occupied the position of Professor, and I consider that that Chair has realized my most sanguine expectations. I think it would be a very great pity if that Chair were allowed to fall through want of support by the public in offering the funds needed for its permanent establishment. The amount required for the permanent endowment is not very large, and I hope that before I leave South Australia I may be able to at least take part in any such movement.
some steps to inaugurate the collection of funds which shall go towards this object. (Cheers). Now, ladies and gentlemen, I have congratulated the Chancellor and the authorities of the University, and the public of South Australia on the marked and distinguished success which has attended this University so far. I will only say in conclusion that the most eminent and best wishes for its future success and whether I return here as a visitor—which I sincerely hope I may do—or whether I watch its proceedings from afar, it is one of the institutions the success of which I shall watch with the greatest pleasure and interest. I leave you now with the assurance that the University will always have my best wishes for its continued prosperity and success. (Loud cheers).

ADDRESS BY PROFESSOR BRAGG.

The annual address, which was read by Professor Bragg, was as follows:

There is nowadays a very general complaint that the education conducted in our high schools is of no practical value, and the objection that which means is meant to be that boys and young men, when they enter on the practical business of life, do not find that this education is the help to them that it ought to be.

It is my wish today to-day to help if I can in the enquiry as to how far this complaint is true, in the making clear the nature of the defect in our manner of education, and in the determination of the best means of removing it.

I am aware that in venturing to address you on a subject of such difficulty I have not the warranty which is given by a long experience of teaching. I must rather speak to you as one who has lately been a student, who is familiar with the anxieties and doubts as to his future occupation which often beset the student nearing the end of his term of education, and with the humiliation with which he feels that all the time and cost and troubles have been a waste of his efforts in a field of useful employment which they should have done. I have felt then, and still do feel, that there is a ground for complaint. I have tried to study the question, and though I do not claim that what I have to say may be in any way conclusive, yet I hope it will be found suggestive.

It is quite clear that when boys and young men have “finished their education” they have great difficulty in finding work to do which calls into play the faculties and suits the tastes that have been developed in them, and at the same time is remunerative. What they have learnt does not seem to be immediately applicable to their new conditions.

A boy leaves school with his mind stored with literature, mathematics, and history, and somehow they do not seem to lead to anything. They do not make of him at once a good farmer, or manufacturer, or engineer, or a successful producer of wines; there is still some further training for him to undergo before he can obtain a living. There are one or two obvious ways of doing this. He may, for example, enter a school of law or medicine, and in these cases the previous school training is of direct value; numbers enter these professions and they become overstocked. Many boys, far too many, become office clerks, when they find that the most of what they have learnt is of no great use to them; it does not help them to advance and if they do not advance they remain in
position which is often unworthy of the time and trouble spent on teaching them. If a boy is apprenticed to an engineer say, or an architect or a manufacturer, or if he intends to be a farmer or a producer of fruit and wine, he has almost to begin his education over again.

There are a great many who say that this is because the subjects taught under our present system of education are not comprehensive enough; they do not see any use in Latin, for instance, because Latin is not in common use in business; or in mathematics, because the majority of men get along without them. They have a somewhat confused notion that the difficulty would be ended by the introduction of a system of technical education under which a boy's training before leaving school would be such as to fit him directly for some particular profession or occupation.

But if a number of those who hold such opinions were asked to make definite statements of what they would consider a sufficiently practical curriculum, their statements when set side by side would be found to have very little in common; for the parent who intended his son to be a merchant would say that he would like to see arithmetic, bookkeeping, French and German, political economy, and so on the principal subjects taught; whilst he who was going to make his son a farmer would see very little in French and German, or political economy, but would rather his boy should be taught something of the chemistry of agriculture and animal physiology. And other men would think those subjects most practical which would be most directly applicable to their own individual cases. Evidently it would be impracticable to teach so many subjects at schools, to undertake such a comprehensive system of technical education. And, indeed, the evidence given by educational experts to the Royal Technical Commission, the employers, before the late Royal Technical Commission is conclusive as to the fact not only that it would be impossible to attempt this, but even if it were possible that it would not be desirable to do so. It is true that the enquiries of this Commission were limited to the discovery of what ought to be done in the way of providing technical instruction in the Government schools; still it is easy whilst reading the evidence to see that the principle of common education, of educating the boys of our middle classes, there is quite enough tendency at the present day to subdivide work—to give to each man one small circumscribed sphere of labour—in fact, to make a machine of him, and it would be wrong to encourage this tendency. Suppose in the manufacture of a watch one man were only taught to make mainsprings, and another only balance-wheels, and another only hands, and so on, and each were to know nothing of any part of the watch but what he himself made, it might be possible so to make machinery — all to work at a high rate; but the imaginative and designing faculty of those men would all be wasted. They would not suggest any improvements in the manufacture of a watch because to do so they would have to consider the effect of any alteration in the whole watch. Moreover if any new and better system of registering the time on the dial-plate were introduced some system which did away with the hands then the man who made hands only would find himself thrown out of employment and...
his skill valueless. He would oppose most heartily the introduction of any such improvement. Again, the cramping of the imagination and intelligence of these men which would be the consequence of their having no inducement to design, would injure them—lower them intellectually and morally. I think you will see from this analogy why it would be deplorable to make a boy choose early the business he is going to follow, and to confine his attention only to such subjects as had an immediate bearing on this business. He might so become capable of doing very well a limited number of things following the rules he had been taught, and so long as the things he could command a price he would do well enough. But it is when the spirit of commercialism begins to pervade the young minds in conducting a business which is the right and profitable one to-day becomes the wrong and unprofitable one to-morrow. Other men's ingenuity and the developments of science are constantly making improvements. If a man is to succeed he must do far more than learn certain rules thoroughly; he must understand the principles on which the rules are founded, be able to understand new principles as they are published, and keep himself abreast of the times.

So it would be shortsighted to limit the education of a boy to those subjects only which would be directly applicable to the trade in which he might be engaged. The tendency of such a course would be to produce a man of narrow mind, incapable of self-development, unable to suggest improvement himself, and averse to them when suggested by others. Whilst a boy is at school his training should be purely a general one.

Nor does there seem to be much ground for hope that the gulf between the book learning of the school and the practical work of ordinary life can be bridged over by any comprehensive system of industrial education in schools. In this country, with its small population, there is not sufficient demand for technical instruction in any but one or two of the chief industries to render it possible or proper that technical schools should be provided to supply it.

Cannot we then draw from all the evidence on technical instruction which has been given before late Commissions, from all the discussion of the subject by eminent men, any lesson as to what may be done to make the educational system in our middle classes more satisfactory and more serviceable?

I think we can. It seems to me that from all that has been said, and from all that may in many ways be observed, there is one obvious practical conclusion to be drawn; it is, that improvement is desirable but not so much in the nature of the subjects that we teach as in the way in which we teach them. In Professor Ramsey's words, "The most urgent educational need of our time is to improve our national system of education throughout, to make it not more thorough and thorough, but more intelligent, more educative and less mechanical in its aims and methods."

The truth is our present system of education may develop in the young generation the capability of fulfilling duties in certain traditional ways, but it does not so train minds that, having a knowledge of the tools that modern science provides, and judgment as to what may be done with them, they may strike out for themselves new kinds of work and new methods of working. It does not...
We teach facts and rules instead of encouraging the student to discover the facts and rules for himself; there is too much teaching and too little educating. In consequence, the boy whom we have taught is a helpless individual; he can only set about earning a living in ways no originality is required, and if he is given chances of self-improvement he makes a bad start. We are not only teaching the boys in finding out things for themselves. This is the great fault of the English system of education. There is good reason for supposing that this has been one of the most prejudicial of the causes that have hindered the development of industries in England; and if in an old country this fault is a source of harm, how much more must it be so in a new country like ours? Of what good would a colonist be, accustomed to rules and without sense of the delight of striking out new ideas for himself—of what good is such a man to a colony where so much is new and so much undiscovered, whose facts are not the same as those of the old world, and where the old world's rules do not apply?

If we are to educate so as to further as much as possible the development of these mental faculties, and at the same time make the results possible and desirable, let me for example try and suggest how with this end in view we might modify our manner of teaching mathematics and physics.

The study of geometry is valuable on several grounds. In the first place it is right that everyone should know how to measure, and geometry teaches the science of measuring. Herein is its utility. But in the second place geometry is also of the greatest value as a mental discipline. It exercises the logical faculties, that is, teaches how to reason truly, and it also provides a grand field for the exercise of the faculty of designing, and in teaching geometry these are the two great points that must always be kept in view. But I do not think there could be any more certain way of missing these points than by trying to teach geometry to beginners by some system to work out the propositions of Euclid. Euclid has written a geometry in which the propositions are founded on a very few simple axioms and, in the logical deduction of geometrical truths from these axioms, he has displayed methods of reasoning which are the admiration of trained mathematicians for their force and delicacy. But boys, with minds as yet but little trained, are utterly unable to admire or to grasp his principle; his propositions are to them mysterious and partial, and their buildings and deductions in them a disastrous geometry, and a false idea of their own inability to learn it. When a boy, for example, is shown in the fifth proposition of the First Book of Euclid that a perpendicular...
The base of an isosceles triangle are equal, he is shown in a very cumbersome way what is almost evident from inspection; and you are expecting from him a very large measure of faith in the ultimate good of what he is doing if you think he is going to be enthusiastic about proving that the angles are equal without assuming anything but two or three axioms, when he can see it much better by drawing an isosceles triangle on a piece of paper, cutting it out, turning it over, and seeing that it still fits in its reversed position, the hole from which it was taken. If a boy's way is by his own reasoning he is likely to interest the boy. It will interest him when he grows a good deal older, but not when he is young—too abstract for him. He will like the concrete proof best, and there is a certain amount of ingenuity in it which will appeal to him. And if you who are teaching him, cause him to do this with several isosceles triangles of different shapes and sizes, he will by actual experiment find that the angles at the base are always equal, and you can then draw from him the explanation that this fitting on reversal must always occur because the two sides are equal. In this way you educate him in observation, in reason, in generalization, in collecting facts and making him observe facts, then make him collect them under a rule, then cause him to exercise his reasoning faculties in discovering the explanation of this rule.

If you set the boy to learn the fifth proposition as it is proved by Euclid, it is true that you give him a beautiful piece of logic to study, but he cannot appreciate it; hence you miss one of the two great points for which the study of geometry is valuable, that is the cultivation of the boy's logical powers; and since you frighten him with the amount and complexity of reasoning necessary to prove so simple a thing, you utterly take away from him the spirit of research for himself; and so you miss the other, the cultivation of his capacity for original and constructive work.

But if, only giving hints when necessary you lead a boy to observe the fact to discover a proof, experimental first and general afterwards, you teach him to think for himself; you show him that geometry is rather an easy thing than otherwise, and make him experience his own powers. The next little proposition you give him to do he will attack with a will, and with some experience in attacking. And if you build up a knowledge of geometry in this way how thorough it will be! The boy will have worked out most of it for himself, and the knowledge will be discovered for himself will be a very different thing from knowledge merely taught him, with the necessity attached that he must think of it in the same way that Euclid did, whose logical faculties when he wrote his Elements were in a very different condition from those of a boy. If I may make a somewhat Irish remark, I will say that, if Euclid had had to learn his own Elements when he was young, he very probably would not have been able or inclined to write them afterwards, and that would have been a great loss to us.

It would, of course, be impossible for me now to give in detail a new system of teaching geometry, nor if I had time would I venture to do so, as I have had so little practical experience in teaching, but I hope
have made clear by the example I have given
the spirit of a system whose details each
school is going to work out for himself, a
system which would train boys to think and
design, and which would be full of life as compared
with the dead system of teaching rules I am
perfectly understood.

It may be said that there would be practical
difficulties in examining boys so taught; but
we were not to confess that a bad system of
teaching geometry must be maintained simply
in account of difficulties in examining, these
and we should be making the examination
our master and our servant. But there is
no case for any such confession. I am sure
a geometry paper can be so set as to place
the boy whose reasoning and designing faculties
have been trained far above a boy who has
merely learnt propositions, even though the
former does not know a single proposition,
and the second knows his
K"vli from
cover to
cover. There has been published also by
an Association of mathematicians a
Syllabus of Geometry. Perhaps we in this
country could adopt it; and each teacher,
while adhering to the sequence of propo-
sitions so established, could use as text-
books any other he pleased, or again, as I think would be
advisable in teaching beginners at all events,
use no text book at all. The nearer we can
get to making each boy write his own text-
book the better.

Algebra and the analytical sciences in
general are of less value as a means
of training than geometry, but they are of course of
great utility. A great deal of
scientific work, especially of the higher kind,
is completely dependent on the results of
analysis; and their study is an obvious prac-
tical necessity.

Now, the working out of a practical question
by analytical methods consists generally
of processes of two kinds, quite different in
their nature and in their effect on the train-
ing of the mind. To the first kind of process
belongs the grasping of the question that is to be
solved, that is the exact conception of the
data, the clear idea of the nature of the de-
sired result, and the production of a system of
all the facts and reasonings which bear
upon the question, and are known to the
operator, and finally the expression of all
these in the symbolical language of mathe-
ematics, generally in the form of an equation.

Then follows the second process; the symbols
are manipulated; in the higher mathematics
this manipulation involves a certain amount of
skill and ingenuity, but in arithmetic and
algebra, that is, such parts of these subjects
as are generally taught to young children, and as are included
in our public examination schedules, the
treatment of the symbols follows well-
known laws, and often requires nothing more than mere memory on the part of the worker.
The symbols having been thus treated
follows the retranslation of the result into a
practical meaning, and this last process is of
the same nature as the first. Now it is in
conducting problems of this kind that we
ought to try to play some of those faculties
of designing which are of so great importance,
which tend so much to success in life; the
clear understanding of the resources at one's
disposal, orderly mental arrangement of
these resources, a definite idea of what is to
be attained, and the proper selection from
all the resources of those which it is best to
employ in the attainment.

In processes of
the second kind the faculties employed are of a much lower order; clearness and good arrangement and attention are still required, but the things treated of are limited in number to the symbols in the equation, so that there is no exercise of judgment in selection, and they have for the time being lost all meaning, so that the effort of thought is confined to little more than thinking of what the rule says is to be done next. Consequently the first kind of process is of a much more educating nature than the second. But I do not think this fact is generally recognised; indeed, when those of us who examine in mathematics and arithmetic in our public examinations set questions intended not merely to test the capabilities of candidates for remembering rules for the manipulation of symbols, which may have very little real meaning to them, but to find out whether their higher faculties of judgment, comparison, and reasoning have been trained, we meet with complaints that our questions are not straightforward, but are of the nature of puzzles. To a person untrained to think, every question for whose solution he has not a rule ready is a puzzle. The mathematical training is emasculated if it be confined to the treatment of symbols without clear idea as to their meaning by processes which require no originality in their conduct. A mathematical training of that sort is worse than useless, for it leads to a narrow-minded dependence on rules. This surely is an evil habit to encourage, for in practical life we rarely meet with a question which any known rule will fit.

But whilst the mathematics, geometry in particular, can be so taught as to educate the faculties of observing and designing, the study of the natural sciences is most thoroughly and naturally fitted for this purpose. Whilst you teach chemistry or physics, or geology, or others of the sciences, you can train the student to observe and experiment, to compare and to