

## Faculty of sciences

*Kjell Carlsen*

Secretary at the F. C. — University of Oslo

### 1. Entrance qualifications

The teaching at the Faculty of Sciences is based on the stage of learning represented by the examen artium, the final examination at the gymnasium (secondary school).

In general the student must have passed the examination on the science line. Students from other lines are admitted after having passed a special entrance examination in Mathematics.

Students with degrees from other universities or colleges can be admitted and credited for their previous studies in accordance with general rules or subject to individual evaluation. Foreign students who have passed the matriculation examination at a university in their own country will generally be admitted to courses at the Faculty of Sciences.

### 2. Duration of courses

The courses of the faculty are divided into two separate parts.

Graduates from the lower course, generally requiring  $3\frac{1}{2}$  years of study, receive the degree *candidatus magisterii* (cand. mag.).

After an additional 2 years of training a graduate from the higher course is given the title *candidatus realium* (cand. real.).

Furthermore, the faculty confers special *candidatus* degrees upon professional graduates who have received part of their training

at independent institutions, like the *candidatus pharmaciae* (cand. pharm.) requiring  $4\frac{1}{2}$  years of study and the *aktuar-kandidat*, the scientific actuary degree,  $5\frac{1}{2}$  years.

Students who wish to specialise in a specific field are offered the *magister scientis* degree (mag. scient.) after 6-8 years of training and based on a final thesis.

Each branch of the faculty is divided into smaller units or subjects. The subjects are estimated as to the amount of work they represent and each is given a number signifying its work load. A course is accomplished through a series of subsequent examinations, one in each subject. For the lower course the students can choose among a great variety of subjects. The majority of the subjects require two terms of study, but some can be accomplished in one term.

The whole instruction program for the lower course is repeated every year.

### 3. Basic subjects

The faculty at present comprises the following 13 branches of science:

Actuary, astronomy, botany, chemistry, geography, geology, geophysics, mathematics, mechanics, pharmacy, physics, statistics and zoology.

Each branch is based on a certain set of fundamental subjects of teaching, which gives

an introduction of vital importance to all students who plan to specialise in a chosen field.

These basic subjects are generally adapted in such a way that they can serve as a supplement for students in other fields.

After having passed examinations in the basic subjects and having at the same time acquired a general view of that specific branch of science, the students in co-operation with their teachers put up a plan for their future study, leaving a broad margin to the individual demands of each student, in accordance with his interests and disposition.

Those who aim at a career as an expert in a particular field will have the possibility to work on their main topic throughout the whole study, parallel to training on special subjects in other branches.

On the other hand, those who prefer a broader education have the opportunity to study a number of basic subjects from different fields.

#### 4. Optional subjects

As already mentioned, the student has a wide variety of subjects from among which he can choose, and it is even possible to pick up subjects from other faculties, e. g. language or philosophy, belonging to the Faculty of Liberal Arts.

What subjects, and to what extent they will give credits at the final examinations is regulated for each course.

This system offers possibilities for a science degree with a considerable amount of knowledge in the humanistic domain.

#### 5. Numbers of hours practical

The student generally attends class and laboratory instruction totalling 20 hours a week during his first year, 15 hours in the

second and third year and approximately 10 hours a week during the last two years of study.

Variations are frequent, mainly due to the fact that subjects based on laboratory work will require more extensive instruction than the theoretical subjects.

Generally speaking  $1/3$  of the instruction hours consists of lectures. The remaining  $2/3$  are divided between laboratory training, seminary, colloquium and other kinds of team work.

The second part or higher course in the fields of chemistry, zoology, botany etc., involves a comprehensive program of laboratory work to be performed by the student.

#### 6. Curricula (priority subjects, etc.)

As mentioned above, it is emphasized that the individual student himself build up his education based on the subjects which he has chosen. This, however, supposes the possession of a certain amount of basic knowledge in the capital subjects of his study.

In branches like chemistry, physics, astronomy, geophysics, the requirements in this respect are most extensive.

Actuary science and pharmacy offer no possibilities regarding choice of subjects.

With the exception of these two courses the student will always have the opportunity of free choice of at least one third of the number of subjects constituting the lower course.

#### 7. Alternative studies (specialisation) within the faculty

The higher course represents a continuation and specialisation of the knowledge acquired by the first degree. As a conclusion

of the second part the student shall prepare a thesis, the topic of which may be chosen from among all fields under the faculty, actuary science and pharmacy excepted.

The student may also undertake scientific work which implies the crossing of borderlines between branches, e. g. chemistry including research work within the field of biochemistry. A further specialisation can lead to the mag. scient. degree, as mentioned above. This is practical, e. g. when a student wishes to combine science and medicine in his thesis for a final degree at the faculty. Research work of this kind is rather frequent within the fields of bacteriology and nutrition physiology.

#### 8. Final degree and intermediate diplomas

The ordinary degree conferred by the faculty are mentioned above under paragraph 2.

The highest degree to be conferred upon any scholar by the Faculty of Sciences is the dr. philos. This title generally implies a continuous period of 5-10 years specialised scientific work in addition to and based on the cand. real. or mag. scient. degree.

The final thesis must represent an independent contribution to and extension of the total knowledge in that particular field.

The degree dr. philos, entitles the bearer to give lectures at the University.

The cand. real. and cand. mag. degrees qualify for positions as teacher in secondary schools. The cand. real. degree is required also for a number of positions in the technical offices of the civil service, such as the Meteorological-Biological, and Geophysical Institutes.

The final degree of pharmacy qualifies for pharmaceutical dispensing positions and, after some year of practice, the right to obtain a

public license for running an apothecary in one's own name.

#### 9. Principal specialised colleges for post-graduate work

Several institutes and departements under the faculty, especially within the border domains of biochemistry, physical chemistry and marine biology have been frequented by foreign post graduate students in large numbers. As the number of ordinary students has increased considerably during the recent years, the room-and working facilities required for post-graduate students has been far too limited to meet the demand.

The faculty has now worked out a 5 years plan which in the first line aims at solving this problem by offering adequate research facilities for post-graduate students in most fields.

#### 10. Openings for employment

It is almost impossible to give a reliable prognosis of the demand for science graduates, as this will always depend on two main factors which are of a variable nature namely the general economic situation and the development within science itself.

There is, however, a marked trend towards a steadily increasing demand for scientists in modern society.

Norway has a comparatively great deficit of science graduates in most fields.

In our secondary schools and other educational institutions on this level we need more than 500 teachers in Mathematics and Natural Science, in addition to those teaching at present.

Industry and research are also complaining about the lack of qualified personnel in various fields of science.