

APPENDIX Examples of modern problems in different fields where mathematics is applied

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post office or police-HQ, those who go to the university to study law or languages, who go to an engineering school, who are going to study medicine, biology, pharmacology, economy, psychology or social sciences, and those who will become astronomers, physicists, or mathematicians, have quite different needs.

3. This differentiation should be reflected in a differentiation of requirements for the final high school examination, which at present, in the Netherlands, are identical for very large groups of students.

As a final summing up, I believe I may say that we as mathematicians should take care that the mass product we produce, viz. the results of our students, admit a satisfactory quality control, that the results we pretend we can obtain can be subjected to the requirements of testability which the statistician demands from every research worker in biology or medicine, that we are aware of the restricted reliability of our tests (examinations) and admit definite tolerance limits, but also that we know how to balance the "yield", differentiated according to different requirements, against the "cost" in the form of teaching- and learning-hours, and know to treat this as a decision problem.

This seems to me to be a duty of honour for us as mathematicians.

APPENDIX

EXAMPLES OF MODERN PROBLEMS IN DIFFERENT FIELDS WHERE MATHEMATICS IS APPLIED ¹

A. *Statistical applications in medicine, biology and pharmacology.*

1. An epidemiological investigation of tuberculosis in Indonesia.
2. Biological standardization of insulin by experiments on rabbits.

¹ The examples are taken from problems treated in the Mathematical Centre at Amsterdam.

3. The number of leucocytes and eosinophil leucocytes in blood samples from women during pregnancy, delivery and childbed.
4. Errors in counting the number of eosinophils in blood.
5. Measurements on eggs of black-headed gulls.
6. The augmentation effect of hypophysis-extract and adrenal-extract on the preputial glands of rats.
7. Scheme for diagnosing rheumatism species based on serological tests.
8. Investigation of the nutritive value of food taken by pregnant women.
9. Regeneration of rat-livers.
10. A comparison of the vitamin B₁ content of blood in old and young men.
11. Investigation of the public health of two rural districts in Holland.
12. Medicines for yaws.
13. The thickness of the layer of blubber of whales.
14. The number of times bats awake during the hibernation.
Capture and recapture of bats for determining the death rate.
15. The influence of light on the growth of tadpoles.

B. *Statistical application in other fields.*

1. Delays in the landing of aircraft.
2. Experiments on laundry cleaning methods.
3. A design of experiments in steel rolling.
4. The frequency of different types of monosyllabic words in the Dutch language.
5. Frequency of delays in a transport system.
6. Comparison of the performance of different types of instruments for repairing broken threads in a spinning mill.
7. Statistical analysis of psychological tests.

8. Comparison of practical work in elementary physics required for students in various Dutch universities.
9. Regression-analysis of the power absorbed by a ship's propellor.
10. Statistical analysis of an investigation of the so-called "earth rays" and dowsing rods.
11. Statistical work for the Flame Radiation Research Joint Committee.
12. A design for a quality control system for an electrotechnical factory.
13. Sociological research on the flood disaster in the south of the Netherlands in 1953.
14. Statistics of mixing solid particles.
15. The life-term of jet planes.
16. Research on a time-scheme for glassgrinders.

C. Problems treated by the Computation Department.

1. The investigation of the shape of a fresh-water body under the dunes near Amsterdam. The investigation was carried out for the benefit of the watersupply of the city.
2. Computation of zeros of polynomials in connection with vibrations in railwaycars.
3. The temperature of gasparticles in a hot-air engine.
4. Calculation of the tides on a river on behalf of the government.
5. Integrals of scattering factors occurring in crystallography.
6. The computation and the expansion of triple integrals originating from the theory of cosmic rays.
7. Design of ships-propellers to prevent cavitation of the propeller-blade.
8. Solution of Schrödinger equations.
9. Computation of the form of ships.
10. Radiation-functions occurring in astrophysics.

11. Wavefronts in connection with soundings for geological exploration.
12. Computation of coefficients in connection with vibrating airfoils.
13. Integrals in connection with temperature distribution in the human skin.
14. Redesigning a road-system to ensure easy transport of sugarbeets in a rural district that has been flooded.
15. The upheaval of Fenno Scandia.
16. Flutter computations for wings of aircraft.
17. Computation of the production of oil-wells.
18. Design and computation of filters for carrier-wave telephony.
19. Radiation of cobalt bomb in cancer-therapy.
20. Fields of radiotransmitters.
21. Forces occurring in certain molecules.
22. Inversion of matrices of a high rank.
23. Flow in homogeneous porous media in connection with watersupply.
24. Boundary-layer computation for aircraft.

LE ROLE DES MATHÉMATIQUES
DANS LA SOCIÉTÉ MODERNE ET SES CONSÉQUENCES
POUR L'ENSEIGNEMENT MATHÉMATIQUE

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Résumé

L'auteur décrit le besoin accru d'après-guerre de mathématiques et de mathématiciens dans le domaine social et industriel. Un exposé plus précis de la situation aux Pays-Bas contient une description des travaux mathématiques faits en vue d'éviter