Biosciences in the pharmacy curriculum

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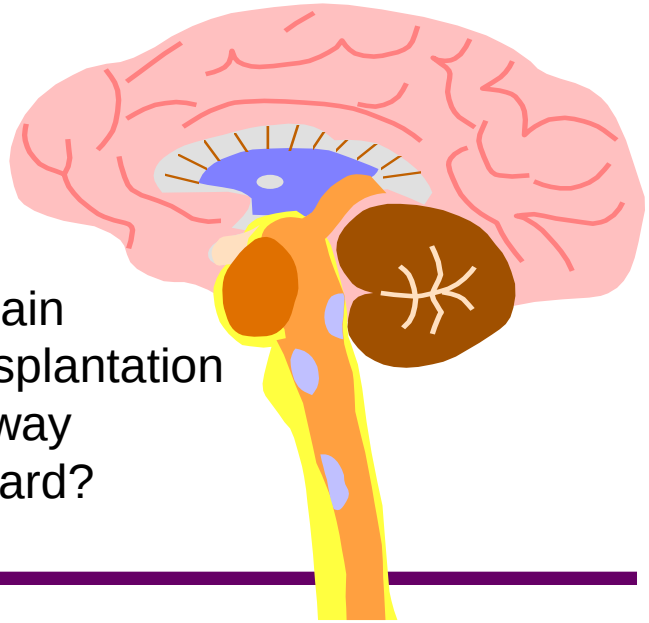


Is brain transplantation the way forward?

Supporting teaching in higher education to improve the student learning experience in the Biosciences

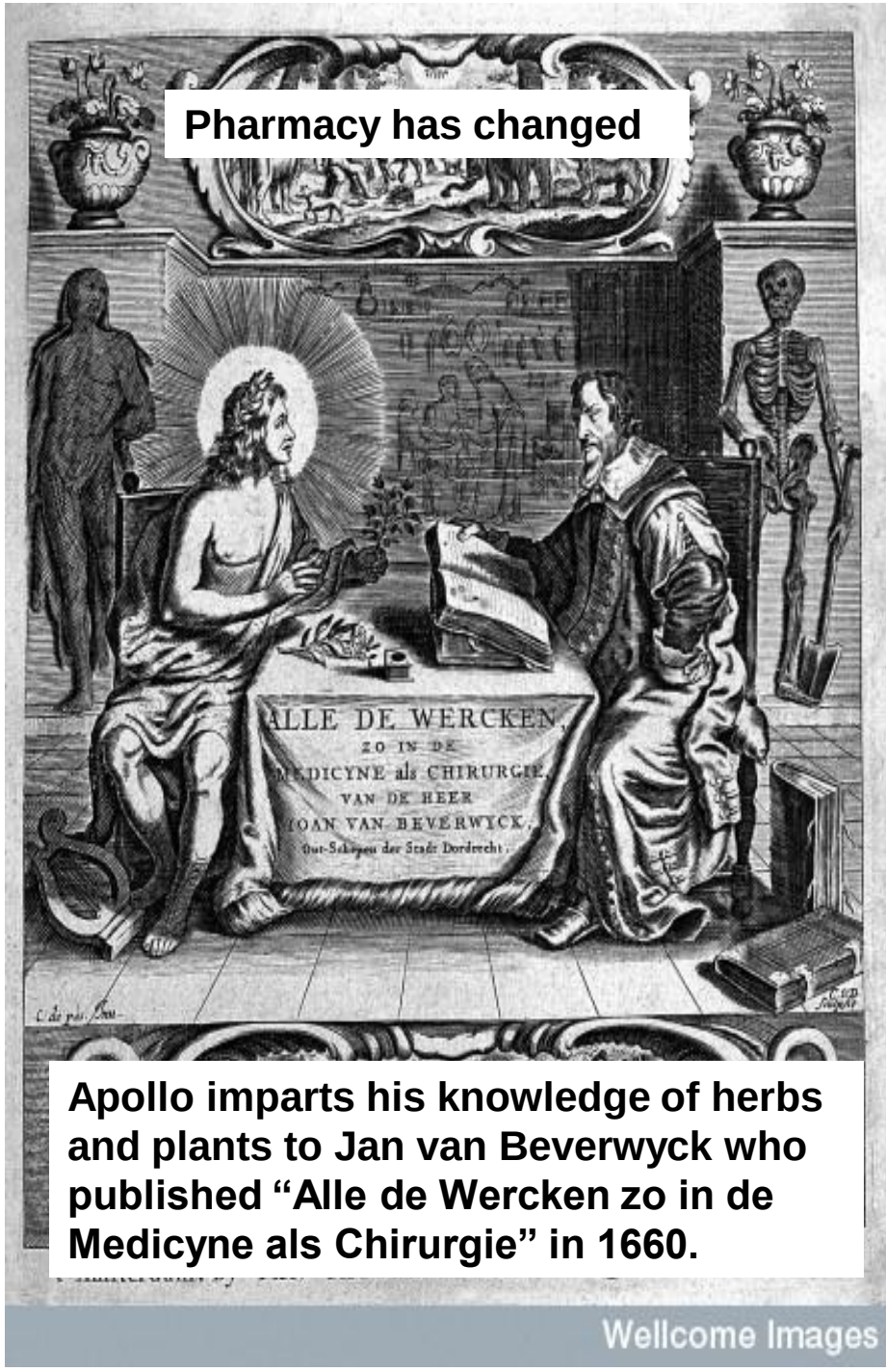
Exam question

How do we balance science and practice in the curriculum?

This is the question I would choose not to answer!!

A bioscientist's view

- Dad was a retail pharmacist and I took a Pharmacy BSc at Leeds, 1962
- Professor of Pharmacology, Univ of Leeds, research in both science and teaching
- Chair NHS FT hospital £120m/y
- General Osteopathic Council; Judicial Appointments Commission; Bar Standards Board; General Social Care Council; Richmond Fellowship; London NHS Deanery

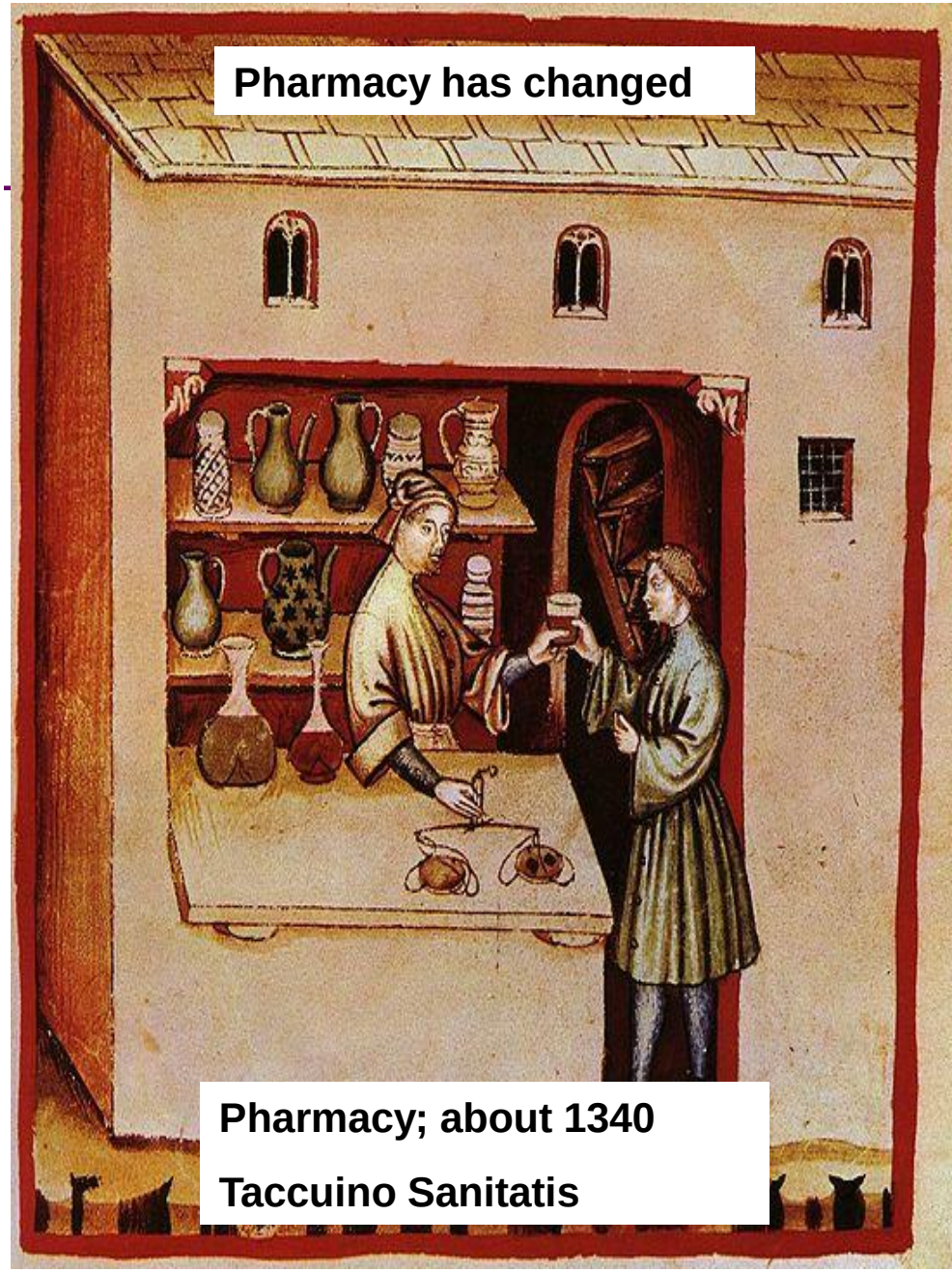


Apollo imparts his knowledge of herbs and plants to Jan van Beverwyck who published "Alle de Wercken zo in de Medicyne als Chirurgie" in 1660.

Is there A curriculum?

- **The Regulator -** requirements must be met
- **The Teaching Institution -** may have different: mission; product; areas of expertise; focus; market
- **Empire building by teachers –** internal politics were (are) important
- **Not just about today -** preparing students for 40 years of a professional career (chronic disease management, personalised medicine)
- **Students' professional needs –** retail; hospital; academic; administrative; public health; industrial (formulation, analysis, discovery, trials, manufacturing, regulation……..)

One size does not fit all



Should graduates be oven-ready, partially- or fully- cooked?

- **For which job?** Very different requirements for specific knowledge, attitudes and skills in the different types of job
- **In what environment?** The dispensing pharmacist in Guyana does a very different job from the dispensing pharmacist in UK
- **Do graduates know what they want to end up doing?** Some do, some don't, some change career direction after graduation
- **Areas of special knowledge, options and choices.** Should all graduates have the same flavour?
- **Role of CDP –** and of apprenticeships/internship

Horses for courses – or the reverse!

Diosolides de Materia Medica
Spain; about 1120

Teaching everything graduates might need is impossible

Meeting the requirements of the Regulator is a MUST!

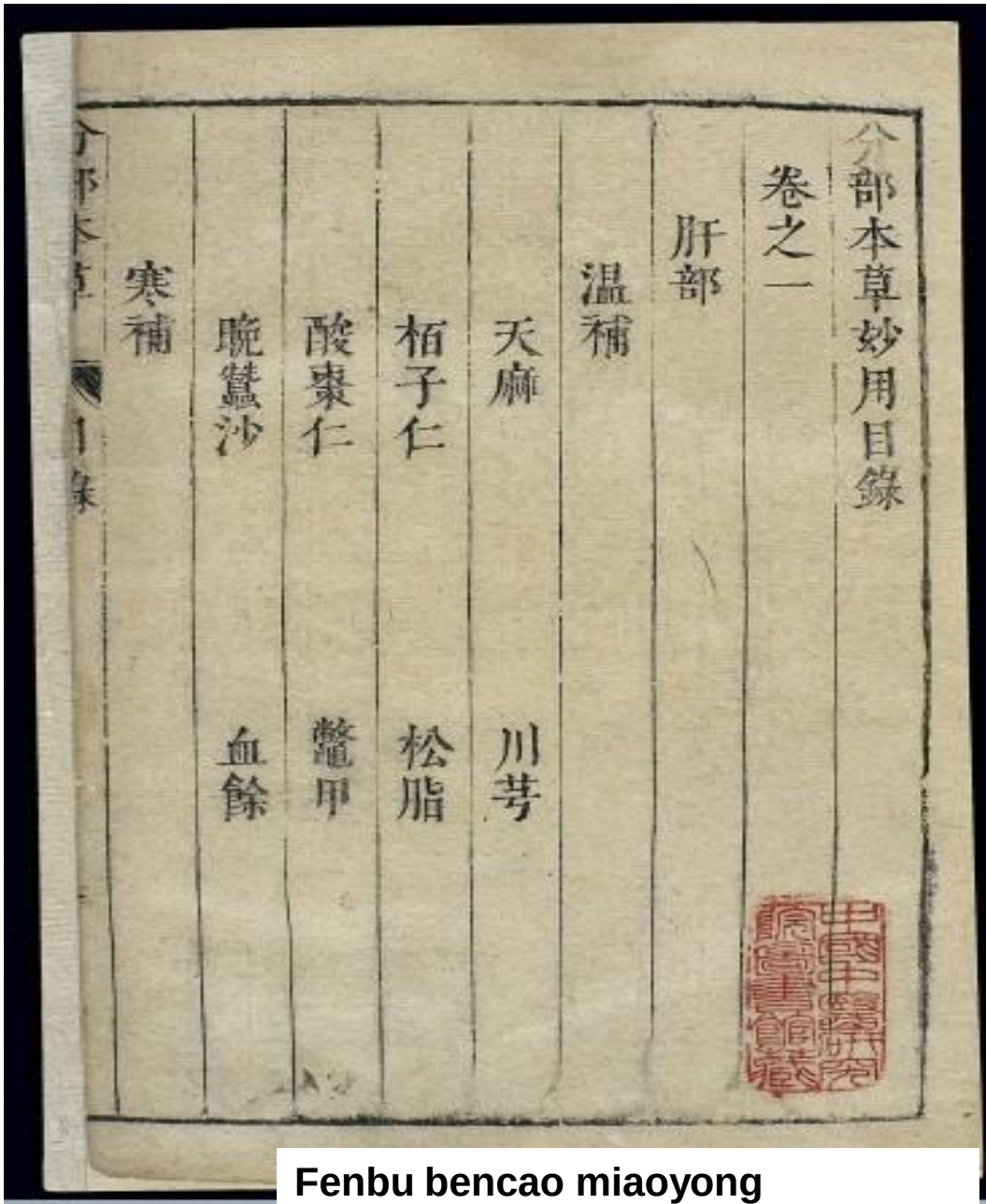
+ Broad grounding in all aspects

+ Some areas of great depth (as options, exemplars, specialities, flavours)

+ Expertise in developing and building on basic knowledge, skills and attitudes

Part of a continuing process of learning to meet developments in career and discipline.

Pharmacy has changed



Fenbu bencao miaoyong Pharmacopoeia published in 1630

The case for biosciences

What does pharmacy involve?

- **People** – are biologically animals
- **Diseases** - a malfunction of a biological organism
- **Medicines** – affecting biological systems and biological systems affecting medicines

What do biosciences bring to pharmacy?

- 1. general features of bioscience
- 2. specific bioscience knowledge

Pharmacy is a discipline, teach the discipline's needs.

Integrate for pharmacy - move away from Science Silos

Cure for drug dependence – "contains a vital principle heretofore unknown". About 1900

1.General features of bioscience

Variability – biological variation, the answer for today is not necessarily the same as the answer for tomorrow

Individuality – each individual is unique, what works for Fred does not necessarily work for Guido

Populations – involve a distribution of variability

Multi-factorialism – no single cause, many contributing factors, inter-dependent systems

Options and Risk – each of several solutions will carry different risk elements

Response – self-healing, placebo or effect, maximum, dose-related

Selectivity – all medicines are poisons – it's the dose that matters

Apothecary John Simmonds with his apprentice, William, in John Bell's pharmacy 1842

2. Specific bioscience knowledge

Anatomy – where things are, not the names of every muscle
Physiology – how the body works, not the interpretation of a 12 lead ECG
Biochemistry – processes involved in basic physiology, not the molecular chemistry of every signalling pathway
Genetics – personalised medicine and genetic predisposition to disease, not to know the human genome sequence
Microbiology – relationship to disease and medicines, not identification
Pharmacology – pharmacokinetics, interactions, adverse reactions, poisoning, pharmacogenetics, medicine effects
Medicine – disease processes, chronic disease management, diagnosis

Curriculum development

I learned to make pills, prepare suppositories; make ointments, prepare and fold powders

Today's pharmacist does none of these but distributes pre-prepared medicines; spots errors and interactions; reviews medication; provides advice

Tomorrow's pharmacist??? Individual therapy; personalised medicine; genetic testing/ counselling; chronic disease management; diagnosis + prescription of medicines; well-being clinics (obesity, dementia, asthma, allergy + ……..)

Pharmacy is changing

Aspirin advert; New York Times, 1917

Balance between biosciences and other sciences?

No single answer – horses for courses; therefore allow choice by students but define CORE

It's the wrong question! – meeting the <u>needs</u> of the flavour of pharmacist you are producing is what it's about; the balance is what the balance ends up as! We should start by thinking of needs, not of balance!

Integration of training/education for pharmacy; get away from science silos; tailor by pharmacists for pharmacy

Take home messages

There is no single curriculum in pharmacy; what is taught will depend on the needs/interests of the students, the regulator, the institution

The course should be an integrated one; to provide what information/skill/attitudes are needed by pharmacists

The balance should be determined by and depend on the above – the balance should not drive it!

Get away from science silos – pharmacy is a discipline in itself, not just a mixture of other disciplines

In a competitive market for students the consumer is king – but teacher knows best! Course fees; student demand;

Core and options tailored to pharmacy – customer satisfaction; broad appeal; resource/staffing implications; timetable nightmare; budget problems

As educators we must deliver the best for the pharmacy profession as part of a life-long process