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PLANTS IN CARDIOLOGY

Erythroxylum coca Lam.
Kohler F E. *Medizinal-Pflanzen*, Atlas. Gera untermhaus: E Kohler, 1887, plate 76.

Procaine and procainamide

In the early 1930s a Dr Claude S Beck was undertaking pioneer cardiac surgery at the Lakeside Hospital in Cleveland, Ohio. He was attempting to revascularise the heart in angina pectoris by putting a pedicle graft of pectoralis

muscle onto the left ventricle and he was also doing pericardiectomy for constrictive pericarditis.

But arrhythmias during and after surgery presented an important problem which was investigated experimentally by Dr Frederick R Mautz. For this study he chose drugs in the cocaine group because they were readily absorbed from mucous membranes and were already known to have some effect on the myocardium. Mautz showed that in dogs procaine produced a monophasic local injury current in the epicardial electrogram and that it prevented extrasystoles when the heart was stimulated electrically (*Journal of Thoracic Surgery* 1936;5:612-28). Procaine had a quinidine-like effect but its action was short-lived owing to esterase action. Its analogue procainamide (Pronestyl) introduced in 1951 had the advantages of being enzyme resistant and active by mouth.

Cocaine was isolated in 1860 from the South American coca plant *Erythroxylum coca* (Erythroxylaceae). This shrub, the "divine plant of the Incas", grows in the eastern Andes and had been used since ancient times to induce a pleasant mental state, to combat fatigue, and increase physical endurance. This folk medicine interested Sigmund Freud and in 1884 he studied the properties of cocaine with the help of his Viennese colleague Carl Koller who was an eye surgeon. When it was found that cocaine numbed the tongue Koller at once realised its potential in ophthalmic surgery. It soon became widely used as the first ever local anaesthetic but its stimulant effect on the nervous system was unwelcome—though Sherlock Holmes took advantage of it. The less toxic synthetic compound procaine was made in 1905.

The small tropical family Erythroxylaceae has no other species with medical uses. It is interesting that two other antiarrhythmic compounds namely lignocaine and quinine are also local anaesthetics (*British Heart Journal* 1991; 65:165 and 66:301).

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