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Osborne Reynolds

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Osborne Reynolds

Die nach ihm benannte Zahl, die das Verhalten von Körpern in Fluiden beschreibt, ist den meisten wohl noch aus dem Studium bekannt. Doch was hat Osborne Reynolds sonst noch geleistet? Eine Kurzbiographie.

Have you ever noticed how, when you walk on wet sand, it momentarily dries out around each footprint? That *odd* behaviour was explained in 1885 by a British engineering professor at the University of Manchester. He was Osborne Reynolds, and he wanted to explain nothing less than the very structure of the universe.

In his later years, Reynolds tried to replace the *then-current ether* theory with the idea that the universe is filled with tiny granular particles; hence the interest in sand. Well, we've forgotten his granular theory, but not the rest of his work.

Reynolds came from a long line of Anglican *clergy* in Northern Ireland. He was *drawn* into his father's hobby of math and mechanics, and he was talented. He was 25 when Manchester made him a professor. We know him best for his work on the flow of fluids – like water, air, oil or steam. His Reynolds Number is a *ratio* that shows the effect of viscosity in a flow. Compute it, and you'll know the nature of the flow before you see it. The Reynolds number for a *bearing* ball sinking in honey is less than one. For a *reed* in the breeze it might be a hundred. For a golf ball in flight it's over 200,000.

From those numbers you expect to see no *hint* of irregular fluid motion as the bearing ball *creeps* through viscous honey. You expect the reed to *sway* rhythmically as air *peels off* in *vortices* behind it. The golf ball is *dimpled* because, at that Reynold's Number, dimpling *enhances* turbulence. It narrows the *wake* and increases the ball's travel by fifty percent.

Reynolds' genius gave us much more. He also worked in electricity, magnetism, and astrophysics. But no book on fluid flow fails to *mention* Reynolds' name early and often. It was he who explained how an oiled bearing lets a shaft ride on a *cushion* of oil without touching metal. Reynolds first figured out how to use mathematics to describe the flow of oil between the shaft and the *sleeve*.

A large painting hangs in the engineering building at Manchester. It shows an aging Reynolds with something like a reserved smile playing about his lips. In his *lap* he holds a *shallow* bowl filled with *marbles*. It's a demonstra-

	*see list
strange	splashing particles
	aerosol
	*see list
churchmen ... pulled	
realionship	
	*see list
	*see list
indication	
slips	
swing ... shaves off ... swirls	
indented	
amplifies	
trail	
bring up	
buffer	
	*see list
	*see list
glast balls	

tion of his ideas about the granular substrate of the cosmos. But his gift to us lies elsewhere – under the *hood* of your car, in the motion of a supertanker, in the human aorta.

So what about the way wet sand dries out when you walk on it? Reynolds realized that *lapping* waves bring sand to an optimal packing with *grains* as close together as they can get. Stepping on it disturbs the packing and creates more empty space. Water flows away from the surface to fill the spaces.

That behaviour is important when we handle any kind of *particulate matter*, but Reynolds wasn't thinking about commerce. He simply had a mind that stayed in constant motion – a mind that quite literally saw the world in a grain of sand. ■

Prof. Dr. John Lienhard, University of Houston

<i>bearing</i>	Kugellager
<i>clergy</i>	Geistlichen (pl.)
<i>creep, to (crept, crept)</i>	kriechen, schleichen
<i>cushion</i>	Polster, Kissen
<i>dimpled</i>	mit Grübchen
<i>draw, to (drew, drawn)</i>	anlocken, ziehen
<i>enhance, to</i>	verbessern, steigern
<i>ether</i>	Äther
<i>grain</i>	Korn
<i>hint</i>	Hinweis, Spur
<i>hood</i>	(Motor-) Haube
<i>lap</i>	Schoß
<i>lap, to</i>	plätschern
<i>marble</i>	Murmel
<i>mention, to</i>	erwähnen, nennen
<i>odd</i>	merkwürdig, seltsam
<i>particulate matter</i>	Schwabstoffe, Aerosole
<i>peel off, to</i>	abstreifen, abdrehen
<i>ratio</i>	Verhältnis
<i>reed</i>	Schilfgras
<i>shallow</i>	flach
<i>sleeve</i>	Buchse, Hülse
<i>sway, to</i>	schwanken, wiegen
<i>then-current</i>	damals gängigen
<i>vortex (pl.: vortices)</i>	Wirbel, Strudel
<i>wake</i>	Wirbelschlepppe, Nachlauf

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