

Congressional Spiders

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Observe the spider on the wall...by what natural magic does he grip?

Rough plaster or smooth tile, neither is a challenge. Perhaps when static he retains his place... but when he moves, why does he not slip? And then a pounce on a victim... and yet he still beats off the challenges of gravity while hanging on to his supper. A phenomenon which science has indeed solved and the answer lies in hairs..... thousands upon thousands of hairs congregated on each foot and don't forget there are eight feet! Every hair is divided into even smaller and finer filaments, the smallest which are called setules and each of these terminates in a triangular pad. Even a small arthropod like the Jumping Spider (*Evarcha arcuata*) has about 624,000 setules.

The magic, as described by Andrew Martin of the Institute for Technical Zoology and Bionics, Bremen, Germany,¹ is created by van der Waals forces. Acting at a truly miniscule level, these forces are generated "as a weak attractive force between atoms or non-polar molecules caused by a temporary change in dipole moment arising from a brief shift of orbital electrons to one side of one atom or molecule, creating a similar shift in adjacent atoms or molecules" (after Johannes Diderik van der Waals). To put it succinctly, the momentary shift of the negatively charged electrons result in an imbalance of negativity between adjacent molecules...one is more negative than its neighbour,

therefore an attraction. Van der Waals forces operate only within one or two nanometers, hence the need for the extremely fine filaments of the setules making a close approach to the surface, be that vertical or horizontal. The foot is released by a "peeling" action, somewhat similar to removing Velcro strips.

Although van der Waals forces are much weaker than chemical bonds, they are relevant to all living organisms and is one reason why our own structural molecules remain integrated. The most relevant point about solving the enigma of spider adhesion is the essentiality of close contact.

And CLOSE CONTACT is on offer with the 2015 Congress of the Dental Association. The challenging theme *Health – Honour – Hope* epitomises both the aspirations and the responsibilities of the profession. The array of speakers and the spread of topics make feasible the possibility of experiencing close contact with the philosophy and practice of contemporary Dentistry. The very definition of the word "Congress,"

(an assembly or conference for discussion - *Concise Oxford Dictionary*.) points to the opportunities for the acquisition of beneficial knowledge and experience, be this by close attention during the lectures sessions or by osmosis, as contact with our peers builds acumen through exchange of opinions and the sharing of skills.

The Association is already well advanced in meeting some of the hopeful aspirations of the profession. Considerable effort has been devoted to enhance the business acumen of members and our CEO, Maretha Smit, has been able to announce a number of advances...future business models, the appeal against the compulsory registration of dental assistants, establishing funding streams which are available to Dentistry and finalising the new coding guidelines. All these initiatives will be reinforced by presentations and discussions in Durban when congress registrants will have close contact with an entrepreneur, with motivational speakers, a business technologist and with an investment analyst. Intercalated in all these is a common theme... how does the profession balance the lure of (too easily secured) financial benefit with the ethics of sound practice?here the reassurance of recognising HONOUR is the key and it is fitting that this concept is the central word in the threefold theme, offering as it does a referential anchor. The session considering Dental Protection, will bring this vision into perspective, helping to ensure that HEALTH is a vital concept in the way we operate our practices.

But HOPE is also vested in the anticipation that innovative techniques



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and clinical advances may be revealed, whether in the lectures or in the corridor conversations....and to whet the appetite are presentations on the Cerec unit, on cosmetic/aesthetic dentistry, on the application of lasers in the dental clinical field and on the use of CAD/CAM techniques. Implants are certain to feature, as will the debate on new materials. The wealth of clinical experience made available through the Congress is vast and registrants will be able to test their procedures and achievements against those of leaders in the different fields.

Dentistry is a healing profession and enhancement of our biological acumen. A greater understanding of the *Why* and the *When* and the *How* we treat will strengthen the delivery of quality service to our patients. The intricacies of tissue biology, the sequences of wound healing, the pathology of oral lesions are based on molecular medicine and research in this field is revealing important correlations which will have a resounding effect on the future practice of our profession. Incorporating these understandings into clinical practice will secure better HEALTH for our patients.

It is intriguing that one of the presentations will be by a choreographer... and here I admit that training for ballet is probably harder than most of us trained for rugby.

Consider a second intrigue... discussions on Adhesive Dentistry.... could it be that van der Waals forces are contributing? Could the materials behave

in any way similar to the setules of the spider? A rhetorical question only! But it does focus on the need to explore in detail and perhaps that is the key which will enable us to retain a firm grip on the slippery slopes we must ascend, if we are to keep pace with the rapid and frequent advances in our profession.

Finally:

Attending Congresses for CPD points is understandable.

Understanding what we have attended is rapturous.

Reference

1. Kesel AB, Martin A, Seidl T. Getting a grip on spider attachment: an AFM approach to microstructure adhesion in arthropods. *Smart Materials and Structures*. 2004; 13: 512-8.

SADA

Annual General Meeting (AGM)

Notice is hereby given that the Annual General Meeting (AGM) of The South African Dental Association (SADA) NPC will be held on

Thursday 12 March 2015 at 18:00
Sunnyside Park Hotel, Parktown, Johannesburg

Agenda for the meeting will be posted on the SADA website.

SADA is your Association and your voice counts.



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