

In-depth observations on eye floaters – a challenge to ophthalmology

By Floco Tausin

For centuries, scholars try to find an explanation for the mobile, scattered and transparent spheres and strings in our visual field. Early on in ophthalmological tradition, the origin was thought to be in the eye. The phenomenon was considered a disorder or degeneration somewhere between cornea and retina. Today, eye floaters are believed to be an opacity of the vitreous. However, careful observation of floaters reveals properties that challenge this dominant view and call for a reconsideration of the ophthalmological explanation.

In ophthalmology, “eye floaters” is a collective term for vitreous opacities which are attributed to different causes. In most cases, however, the phenomenon is considered a non-pathological (idiopathic) age-related clouding of the vitreous. In this article, my statements on floaters refer to this idiopathic type. According to ophthalmologists, this wide-spread symptom occurs due to the liquefaction (*synchysis*) and collapse of the collagen-hyaluronic structure of the vitreous (*syneresis*), which at some stage causes the detachment of the vitreous from the retina (posterior vitreous detachment) (Sendrowski 2010). In daylight, degenerated vitreous structures which are clumped together cast shadows on the retina and become visible in the field of vision. Supposedly, this is what we see when we are looking at our mobile, scattered and transparent dots and strings.

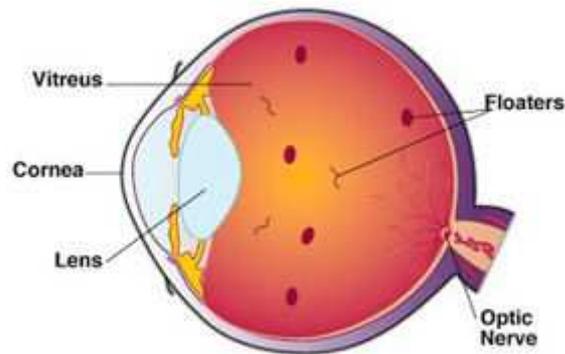


Figure 1 Floaters are seen as small specks in your vision and are usually harmless.

Floaters as vitreous opacities. Source: flickr,

<http://www.flickr.com/photos/andrewcoulterenright/4106224/>

This ophthalmological description is the latest offshoot in a tradition recorded since the time of Hippocrates. Over the centuries, the terms *muscae volitantes* (Latin, “flying flies”) or *myodesopsia* (Greek, “seeing fly-like corpuscles”) were used in Greek, Arab and Western European ophthalmology to describe subjective visual phenomena that look similar to flying flies. From the beginning, a number of eye diseases and disorders were associated with flying flies, e.g. scotoma, cataract or retinal detachment. This reflects the endeavor to localize and explain eye floaters which, in turn, depends on the dominant philosophy: the ancient natural philosophers and scholars stressed that floaters must be in the liquids near the eye’s lens, which was taken as the main element of seeing. Later, the materialistic-mechanical philosophy, on which early modern ophthalmology is based, promoted the notion of floaters as physical objects that move in the liquid of the vitreous near the retina, depending on the movement of the eyes, consistency of the medium, gravity as well as laws of hydrodynamics.

19th century Czech physiologist Jan Evangelista Purkinje explained the spheres and strings as fibrillae, vessels or dead materials near the retina whose shadows were projected on the retina when light enters the eyes. Most present-day eye doctors basically refer to Purkinje's description (Hirschberg 1889-1912; Plange 1990).

In my view, this historically grown equating of spheres and strings and fly-like visual disorders or cloudings is the result of a one-sided objective approach and of disciplinary narrowness. To balance this, I'm going to provide some challenging observations on floaters that I have collected in my many years of holistic research (Tausin 2009a, 2010b). Since individual observation is my starting point and base for my conclusions, I do not claim general validity, but I do encourage the inclined reader to spend some time in close observation of his or her own floaters – as a way to make my findings comprehensible.

Inconvenient questions to ophthalmology

Where does the morphological regularity of floaters come from?

Floaters are dots and strings. The strings are filled with rows of dots or spheres that are more or less clearly visible. The dots are circular and concentric; they contain a core and a surround, viz. they are polar. The polarity is joined by a dualism, for there are two types of dots: those with bright surround and dark core, and those with dark surround and bright core. So we can speak of a dualistic-polar principle in eye floaters. It's hard to imagine that

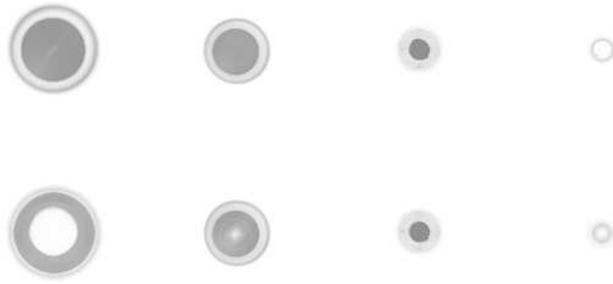
randomly clumped vitreous fibrillae produce dots with such clear and repeated morphological characteristics.



The two contrasting types of polar floater spheres. Source: author.

Why are there different states of floaters?

On closer observation, floater spheres and strings show different states over time: one and the same sphere can appear as big and rather hazy or as small and clearly outlined. The transition from one state to another is fluid and proceeds in different time duration. For the sake of simplicity, I distinguish an initial or relaxed state and a final or concentrated state. In general, it seems that most floaters are initially relaxed, viz. bigger, closer and more transparent; with increasing time of observation, they change into the concentrated state. After completion of the concentration – a quick glance to somewhere else may suffice –, the spheres and strings change back into the initial relaxed state.



The two kinds of floater spheres in transition from a relaxed (left) to a concentrated (right) state. Source: author.

Why do floaters start to light up after some time of concentrated observation?

It is interesting to realize that, in the concentrated state, the spheres and strings increase in brilliance.

Considering an energetic explanation for this, we could say that the amount of light or energy contained in a sphere or string does not change in the process of concentration; rather, the energy gets compressed due to the reduction of space resulting in more brilliance (Tausin 2009a, 2010b). This effect may be influenced by “external” factors: it is encouraged by bright lighting conditions and the distance of the focal point – the closer the focal point, the brighter the floaters. Also, observing the spheres and strings through the eyelashes or a pinhole in a sheet of paper lets the floaters appear concentrated.

It is important to experience, though, that the concentration state is also reached without these aids, solely by focusing on floaters for a while; it is quickly brought to an end by visual distraction. Thus, floaters seem to reflect both outer and inner conditions of light and nearness, or concentration and presence, respectively.

Ophthalmology does not provide an explanation for the different states and the lighting up. Eye doctors, when asked, tend to ignore the question. Some try to explain the change in size as a result of floaters getting closer to the retina while looking up to the sky – gravity pulls the floaters back to the retina. The argument is unconvincing since the same effect can be observed irrespective of whether the eyes look up to the sky or down to the ground. Others trace the brilliance effect back to the scattering and reflectance of light. This is supposed to happen when light strikes the floaters inside the vitreous (Tausin 2005a). The lens effect explanation implies the above-mentioned moving of floaters inside the vitreous. It is problematic insofar as it does not take into consideration the evident regularity of the altering of floater states (the nearer the focal point, the brighter the floaters; the longer the observation, the brighter the floaters). Moreover, the notion of moving dots and strings inside the vitreous raises further questions.

Why do floaters move so quickly if the vitreous is a jelly-like fluid?

Floaters can be set in motion by eye movements. Doing so, they often seem to glide very easily and with high speed across the visual field. This is all the more surprising if we consider that the vitreous is thicker than water and described as a gel (Ruby 2007). How can there be any particles moving so quickly and effortlessly in a jelly-like mass? The classic answer is that the vitreous liquefies over time and floaters become very mobile. This leads straight to the next question.

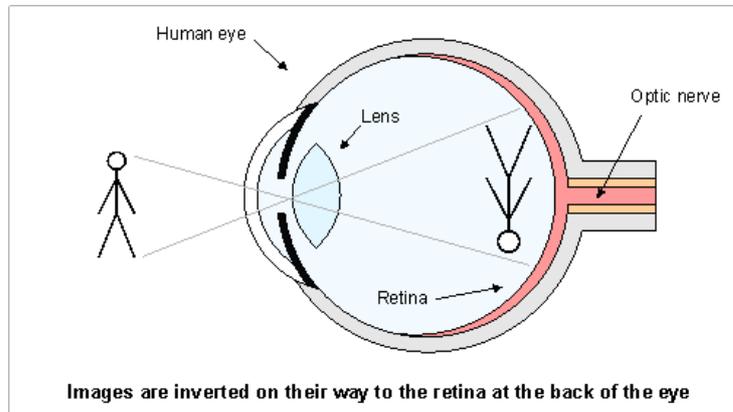
If floaters are particles floating in liquefied parts of the vitreous, why do we keep seeing the same spheres and strings?

Anyone who closely watches his or her floaters will soon become acquainted with them. For these spheres and strings remain the same for years. Through vigorous eye movements we may change the relative positions of the spheres and strings to one another, but only temporarily – the floaters take their starting position soon again. This observation contradicts the notion of free floating particles in the liquefied parts of the vitreous – these would be whirled around with every eye movement and take up new constellations. The medical argument goes that some floaters do not move freely in the vitreous but are attached to the still existing vitreous structure. From the individual observer's perspective, there is no evidence: while some of the strands whose ends go beyond my visual field might be attached, other strings and all of the spheres do not seem to be attached anywhere – but still appear in their characteristic constellations.

Why do floaters tend to sink?

Through eye movements, we can move floaters in all directions. But as soon as we keep our eyes still, we realize that they sink down in our visual field – the nearer and bigger ones faster, the others more slowly. Gravity effects seem to be a plausible explanation for this sinking of physical particles in the vitreous. The case

is more complicated, though: As we know, our eyes project an upside-down image of what we are looking at on the retina.



Source: <http://www.danielng.com.au/fiwee/?p=279> (15.6.11)

If floaters were particles close to the retina that are pulled down by gravity and cast shadows on the retina, then I would have to see floaters rise in my visual field. Since I do not see floaters rising but sinking, the conclusion would be that the corresponding particles in the vitreous do not sink but rise. If that is true, there would be other forces than gravity influencing the upward movement of floaters.

I have asked dozens of eye doctors about this with no convincing results. Most ignore the fact of the inverted retinal image, or consider floaters or the retinal image isolated from one another. Some admit that floaters have to rise in the vitreous if we see them sinking in our visual field. This leads them to speculate about thermodynamics (heat as lifting force) or density (floaters are lighter than the vitreous liquid) as responsible mechanisms for that observation (Tausin 2010a).

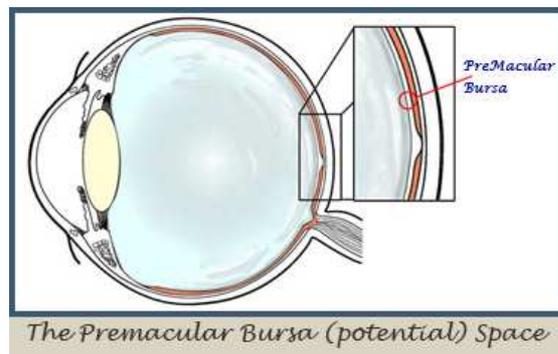
Further inconsistencies in ophthalmology

Why can't eye doctors see floaters in the eyes?

If the so-called “idiopathic eye floaters” are really clouding particles in the vitreous, then one would think that eye doctors see them when looking in the patients’ eyes. In reality, there is often a discrepancy between the patient’s observation of eye floaters and the doctor’s findings in the eye. In many cases, doctors can’t see anything while patients very clearly perceive, describe and draw their eye floaters (cf. Weber-Varaszegi et al. 2008; Tausin 2008). Then the diagnosis goes somewhat like “age-related harmless eye floaters”, together with the advice to just ignore them. Explanations for this discrepancy are easily found: the opacities are too small to be relevant; the technology used is not accurate enough; the doctors do a poor examining job; the patient is exaggerating or has a mental problem. While there might be some truth in all these points, we also should keep in mind the possibility that floaters are not what today’s ophthalmology claims.

It is no surprise that explanatory innovation comes from laser surgeons. In order to treat floaters with the Nd-YAG laser, surgeons have to localize and recognize the different floater types very carefully. The eye doctors James Johnson and Scott Geller explain on their websites that some floaters, especially those in young people, cannot be seen and treated with laser. The description of these “ill-defined” floaters fits the idiopathic ones at issue. The surgeons hold the opinion that this type is not located in the vitreous, but must be between vitreous and retina, a space called “bursa premacularis” (Geller, n/a;

Johnson n/a; cf. Tausin 2009b). This space is potential insofar as it exists only if fluids separates vitreous from retina. In these fluids, rests of cells or fibrillae could remain that become visible as floaters. While the theory is not acknowledged among eye doctors – as laser surgery of floaters is itself treated with reservation by many –, it does not contradict the main strategy to remove floaters: vitrectomy.



Source: <http://vitreousfloatersolutions.com/floatersyoung.html>
(11.6.11)

Does vitrectomy prove the vitreous opacity theory of floaters?

The most powerful argument for the notion of floaters as vitreous opacities are the different forms of vitrectomy, a surgery to remove and replace the whole or parts of the vitreous. Laser surgeons assume that even bursa floaters might be removed by vitrectomy if the vitreous is previously detached from the retina (cf. Tausin 2009b). In literature, there are cases of successful floaters-only vitrectomies (FOV), or “floaterectomies”, in patients with “idiopathic” or “persistent” floaters which had no or little objective correspondence (Roth et al. 2005; cf. Tausin 2005b). In clinical studies that evaluate the outcome of vitrectomies for floaters performed to relieve

the patient's subjective strain, patients' satisfaction is strikingly high – around 90% (Schulz-Key et al. 2011; Weber-Varaszegi et al. 2008). This figure must not be taken as a proof for the harmless floaters being vitreous opacities, though, for several reasons: in these studies, it is never entirely clear what kind of floaters these patients really saw; even if they are called “idiopathic”, patients might not have seen the floater type at issue. Moreover, the patients' satisfaction is influenced by a number of factors such as visual improvement due to removing cataract and even subjective expectancy – the latter, together with the incomprehensible patients' strain as a motivation to get rid of floaters, tends to turn floaterectomy into a kind of psychotherapy (Tan et al. 2011; Tausin 2008). Also, there are many reports of patients that have experienced floaters after vitrectomy (Schulz-Key 2011; Degenerative Vitreous Community n/a). They are explained as remaining vitreous fibrillae or newly developed floaters. Finally, if idiopathic floaters are no longer seen after FOV, there still might be other explanations for this. It is conceivable that the light is channeled through the eye in a different (unstructured) way and, therefore, stimulates the retinal neurons differently, resulting in a vision with less or no floaters. Therefore, I suggest that the origin of floating spheres and strings should be looked for in the activity of visual neurology (Tausin 2009c, translation forthcoming).

Conclusion

Present-day ophthalmology provides a frame to understand and describe the subjective visual spheres and strings known as harmless or idiopathic eye floaters. It is

a historically grown melting pot in which floaters got associated with a number of eye disorders. A close observation of floaters reveals properties for which the disorder theory fails to provide a convincing explanation. Moreover, inconsistencies within this explanatory frame itself tell us to remain critical.

The spheres and strings are a subjective phenomenon. To study them means to be aware of that fact and to start from individual observation. We also have to keep in mind that perception is shaped not only by sensory data but also by our consciousness state, mental dispositions, motivations, cultural and social environments, etc. For example, it is my experience that size, luminosity and movement of floater spheres and strings alter according to different consciousness states. I think that the understanding of experiences like this are crucial in the search of a more reasonable understanding of floaters (Tausin 2009a). The subjective approach does not replace but complement and inform physiological research. For example, the observations presented in this article suggest to consider the role of the visual nervous system in the process of seeing floaters.

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The name Floco Tausin is a pseudonym. The author is a graduate of the Faculty of the Humanities at the University of Bern, Switzerland.

In theory and practice he is engaged in the research of subjective visual phenomena in connection with altered states of consciousness and the development of consciousness. In 2009, he published the mystical story “Mouches Volantes” about the spiritual dimension of eye floaters.

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The book:

„Mouches Volantes. Eye Floaters as Shining Structure of Consciousness“.

(Spiritual Fiction. ISBN: 978-3033003378. Paperback, 15.2 x 22.9 cm / 6 x 9 inches, 368 pages).

Floco Tausin tells the story about his time of learning with spiritual teacher and seer Nestor, taking place in the hilly region of Emmental, Switzerland. The mystic teachings focus on the widely known but underestimated dots and strands floating in our field of vision, known as eye floaters or *mouches volantes*. Whereas in ophthalmology, floaters are considered a harmless vitreous opacity, the author gradually learns to see them and reveals the first emergence of the shining structure formed by our consciousness.

»Mouches Volantes« explores the topic of eye floaters in a much wider sense than the usual medical explanations. It merges scientific research, esoteric philosophy and practical consciousness development, and observes the spiritual meaning and everyday life implications of these dots and strands.

»Mouches Volantes« – a mystical story about the closest thing
in the world.