

## *Whirlwind and Vortex-Powerstation*

### **Motive and Concern**

Early in 2006 Dr. David Daudrich send me his book 'Tropical Whirlwind and Vortex-Powerstation' (only available in German as 'Der tropische Wirbelsturm und das Wirbelkraftwerk', First Minute Taschenbuchverlag, ISBN 3-932805-22-4, 132 pages, Euro 19,80). You don't often find specialist book with clear way of speaking like this. Daudrich describes starting of tropical whirlwinds and affecting forces scientific precisely including many graphs and formula. He deduces optimum shape of powerstations for producing corresponding vortex systems and usage of affecting forces.

I am not really interested in large power stations, but I prefer small decentralized units for power supply. On the other hand, Daudrich points out conclusive just 'disadvantaged' areas could produce not only electric current but also clear water as side effect of these systems. So low-cost desalination and / or irrigation of deserts could be achieved.

Daudrich describes many processes of fluid-theory, similar to my considerations about Fluid-Technologie. That's why I briefly sketch Daudrichs statements and add some remarks and proposals for improvements, which e.g. could also concern my conception of [Autonomous working Suction-Turbine](#).

It's no question, 'Anabatic Wind Power Stations' or such 'Air-Pressure and - Suction Power Stations' have decisive importance for overcoming actual energy situation by economic and ecological means. Every interested person and especially technical specialists can convince themselves concerning feasibility and efficiency of this technology - and with these considerations here I want to support this development.



### **Second Law of Thermodynamics**

In the opinion of Daudrich, blind faith in 'basic law' of thermodynamics impedes technical progress since 150 years. At his other book 'Second Law of Thermodynamics and its Authority' (available only in German as 'Der Zweite Hauptsatz der Thermodynamik und seine Macht', First Minute Taschenbuchverlag, ISBN 3-932805-33-X, 153 pages, Euro 14,90) he describes convincingly, this 'law' well can determine processes of steam-engines, however other processes of nature not at all are bound to that limitation - and technology of corresponding processes well can achieve surplus-benefits (similar to my claims of [Perpetuum Mobile of Third and Fourth Kind](#)).

I don't want to share that discussions. Daudrich and many other researchers did refute common school of thought by precise argumentation. I just want to mention this: by common understanding every energy-transition can run only with losses in shape of 'inferior' heat, inevitably resulting increasing entropy (structureless equality), thus 'heat-death' of everything. Opposite to this opinion, nature is full of new lives (minus men-made desertions), universe builds all times new complex structures (thus shows decreasing entropy). Even by this general view, previous 'nature-laws' can not fit to processes of nature at all.

On the other hand thus inevitably results, steam engines like combustion technology nor nuclear power stations can not be right way nor measure of nature-conform processes. Aim of this workout thus is to describe driving forces of vortices and to deduce optimum shape of artificial rebuilding that 'motor' which needs no input of energies.

### **Sun-Energy**

By common understanding all energies of planet earth finally come from sun. Daudrich opposes this commonly accepted idea: earth continuously receives huge amount of energy from sun radiations of different kind. However, earth radiates same amount of energy back into space - plus some more energies based on heat-production within earth an little bit produced by men.

System earth thus at a whole is not at all provided by sun. At most, earth stores some energy intermediately for short phases. Nevertheless earth shows lot of energy-potentials, produces kinetic energies and new structures, i.e. decreases entropy, new pulsating life comes up all times - without any net-import of energy. It's also common understanding, tropical whirlwinds can only start and exist based on sun radiation. Despite of this idea, hurricanes 'rage' also at nights and can exist for weeks.

Undisputedly sun is decisive deliverer of energy for earth, where finally all energy becomes shape of 'inferior' heat. Heat is inferior by common understanding, because heat can move only from warm to cold matter, thus inevitably levelling out differences. That process now lasts some billion of years, thus earth should already show deserted monotony. Obviously however nature practices different processes and escapes that fate, regardless of scientific 'laws'.

## Basic of Life

Daudrich surprises by statement, evaporation is one of these 'phenomenal' nature processes - without which landscapes would really be deserted and lifeless. Only evaporation of seawaters produces fresh water, building clouds and transported by winds until precipitation becomes basis of all life at lands.

Evaporation demands work, because water molecules must come off cohesion of liquid and must be integrated into air - against atmospheric pressure. Work can only be done by differences of potentials. Sea water and neighbouring air however show likely temperature, so there is no workable difference in view.

There is huge energy within waters, e.g. in shape of molecular movements, of different intensity depending on heat. However, molecules move totally chaotic, so again this structureless motion energies are not to use for work - by common understanding and generalized nature laws.

## Chaos is not equal to Entropy

Even this heat is spread equal in total, chaotic motions not at all stands for total entropy. Opposite: within chaos inevitably exists coincidence and coincidence inevitably means actually unequal spreading. By pure coincidence some molecules will hit one molecule same time and commonly transfer their motion energies to that single molecule - and if direction of resulting direction by chance shows towards surface of water, then that water molecule got 'evaporated'. Naturally now resting waters became some colder (however this energy-lag soon is balanced by surrounding waters or actual sun radiations).



'Maxwells Demon' was asked to sort molecules by their speeds, in order to achieve usable difference of potentials (and impossibility of this experiment serves as prove for impossibility of perpetuum mobile in general). At [Autonomous working Suction-Turbine](#) mentioned upside (and diverse other chapters) I described, molecules can be 'sorted' by their actual motions directions by rather simple measurements (and structured motions are achieved). Now by that evaporation, chaos-plus-coincidence is reason for production of working energy differences. Daudrich calls thin border between water and air a natural energy-filter.

This process 'consumes' no energy nor heat, because following condensation results old status. Evaporation plus condensation thus need no energy-input in total (e.g. evaporation can exist also at night without any actual sun radiation input). This process of nature is only a temporary 'excursion of statutory entropy'.

## Not usable Gravity

Daudrich calls evaporation as 'starting-motor' of tropical whirlwinds. Into air (with average of 29 weight-units) water molecules (with only 14 weight-units) are integrated. So second 'motor' can start and work, again by force (not usable by common understanding) of gravity (which is totally equal spread and working anywhere).

Humid air (thus relative light) of tropical whirlwind is affected by Archimedes-Lift within surrounding dry air (thus relative weighty). Upward winds produce condensation and resulting heat again reinforces lift. However, also hot air of 'dry' whirlwinds are pressed upward by surrounding colder air.

## Circuits

Daudrich describes motion processes of tropical whirlwinds by schematic pictures, e.g. like sketched at Abb.9 (German Abbildung). Within eye (e, red, German Auge) exists astonishing calmness and clear sky. Diameter of eye can reach 50 km. At border of eye (d) air rises upward vehemently at spiral tracks, within relative small area, which upside becomes shape of wide funnel.

Upside at this area (c, blue) humid air condensates, building massive clouds resulting heavy rainfalls. Only this area of whirlwind is visible. We all know pictures of these impressive structures (e.g. see upside Katrina at New Orleans), which can show diameters of some 1000 km. At this area, vortex produces strong winds of converging air (German konvergierende Luft) at bottom.

Vortex 'slings' out masses of air far outside and upward of that area, building ring (yellow) of high layers of air. Out there exist high pressure and nice weather, while air glides downward. Most parts of these air masses now flow back alongside bottom into increasingly faster vortex. Only based on this circuit, whirlwinds can 'be alive' for days and weeks.

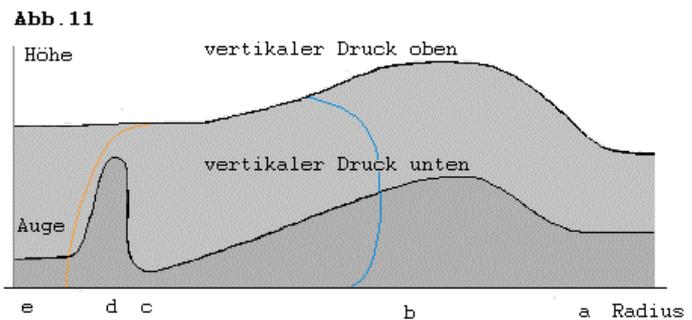
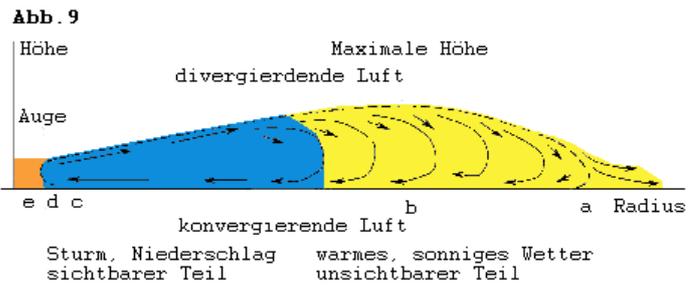
## Pressures and Motor

Daudrich discusses existing pressures in details, here simply marked by Abb.11. At bottom, air pressure (vertikaler Druck unten) rises from (real) border of system (a) slowly towards centre, corresponding to nice

whether of that outer ring (b). Further on towards centre, wind becomes stronger corresponding to falling air pressure. Just before eye, heavy storms come up and air pressure is minimum (c).

Most remarkable is abruptly increasing air pressure at border of eyes (d). Daudrich explains this by enormous inertia forces of air masses flowing from outside towards centre, which now can escape only into vertical direction. Indeed, air is very compressed at this area (see below). At inner side of that upward-motion, air pressure decreases likely abrupt. Also within eye (e), air pressure is relative low, even there exists calm whether and clear sky.

So at bottom exist most different pressures into radial direction. In higher regions however, spreading of air pressures is much more balanced, especially at central areas (vertikaler Druck oben). Differences of pressures all times are reasons for air movements - or vice versa. Most interesting questions now are: how can come up that relative calm situation within eye, why exists abrupt upward-motion at border of eye at this relative small ring, why show tropical whirlwinds increasing intensity?



Daudrich arguments here with constancy of turning momentum, with inertia and centrifugal forces and with forces resulting of pressure differences - most likely to common explanations of phenomenon of whirlwinds. I acknowledge Daudrich's statement, evaporation is first motor of tropical whirlwinds. There is also no doubt concerning second motor in shape of gravity, which results lift of light medium within heavy medium. Third motor however resp. explanations for previous questions however, in my opinion, are quite different.

### No Inertia in Gases

Solid bodies show inertia, as a whole because molecules are integrated within rigid compound. If these bodies are guided at circled track, centrifugal forces are effecting. If these bodies are guided at bended tracks, constancy of turning momentum is valid.

At liquids, molecules are not arranged within rigid grids, nevertheless molecules show some cohesion. So previous statements are valid too, however restricted, just because molecules can escape their cohesion-clusters (e.g. by previous evaporation).

Within gases, each molecule is independent at motions relative to each other. These molecules appear not within a compound, but each can move individual - all times until next collision. Each molecule of gases thus shows inertia only at its straight flight from one collision to next (if spin is excluded).

### Gases flow into Void

General direction of quantity of gas-molecules thus is not determined by inertia. Each molecule moves ahead within space all times only into that direction, in which it can fly most long distance until next collision. This statement contradicts previous arguments of Daudrich and probably also common understanding.

A relative long flying-away of one single molecule has also affect to neighbouring molecules, because now that molecule is no longer available as collision partner or only some times 'too late'. So other molecules, by chance pushed into likely direction, can follow first molecule relative long distance - and thus might start general movement of some quantity of gas, into likely direction within space.

Based on occasional collision, one molecule could be pushed upward. Into direction of universe there are less collision partners on and on. Track of molecule thus is hindered by decreasing number of collisions, so gas-molecule flies up and away into space - and all neighbours follow behind. By this process, planets lost their atmosphere - if no sufficient gravity exists to keep molecules back.

General direction of gas-molecules thus guides all times into direction of less collisions - until gravity does not limit further upward movements. These points of view and consequences now are detailed by picture EV WKW 03.

**Gases flow around Corner**

As an example, distance A to B is 450 m long, like distance each molecule of air flies within one second. Naturally this molecule does not fly straight ahead for seconds. Within resting air this molecule does this distance by chaotic tracks, e.g. like roughly sketched at C.

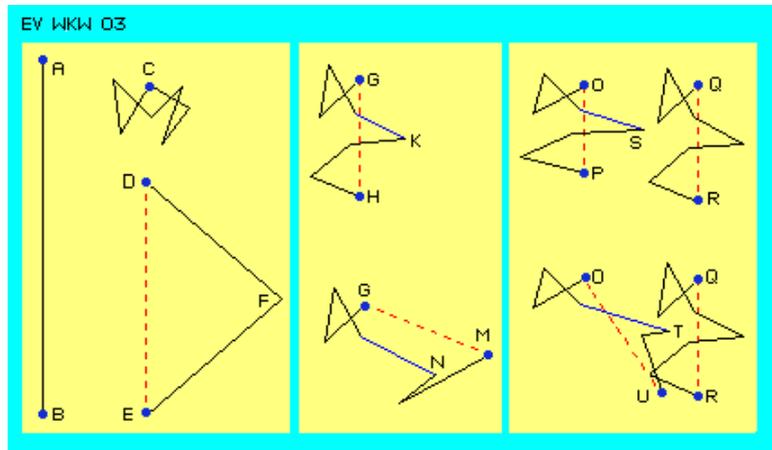
Sound runs ahead through air by some 300 m/s (from D to E). Naturally, molecules involved are not positioned straight line. All involved molecules again move in roundabout ways, which here simply are added and represented by track from D via F to E. At sound waves, molecules involved swing ahead and back, i.e. building local compressions, which at the following are equalized.

If however general movement of air exists, motions cluster (C) of resting air now is stretched, e.g. like sketched from G to H. It's obvious, distance of movement-ahead is only little part of all distances molecules are flying, even at most extreme gale-force winds.

Now it well could be, molecule at one of these tracks is pushed into direction, where purely by chance next collision occurs rather late. Molecule G for example collides not at K but finally at N (tracks marked blue). At the very end, this molecule will come to an other position (M), e.g. cross to general direction of air-movement, like molecule here swerves to the right.

Normally these deviations are balanced. If here right side however exists really area of less density, not only this molecule will fly into this direction (regardless of general direction of wind), but by itself now it leaves 'empty gap', into which previous neighbours also will fall.

By that kind of movements, gases well can do abrupt changes of direction. For example, 'tube' of wind whirls and also of water-vortices can build 'knots' where rotation upside and downside run different turning sense. So it's not astonishing at whirlwinds, storms alongside bottom rather abruptly change into upward movement, just because gases all times escape into direction of less resistance (less density resp. into any 'suction-area').



**Gases flow towards faster Flow**

At right row of previous picture now is shown second kind of changing movement's direction, where faster flow represents previous 'suction area'. From O to P is drawn slow flow and from Q to R is drawn relative faster flow. During one time unit, both molecules run same distances at roundabout tracks. In principle, slower flow shows wider tracks, while faster flow shows tracks more stretched, thus less 'bulky'.

Just that's what Bernoulli realized as constancy of pressures within flows: slower flow has stronger pressure aside (static pressure) and less pressure into direction ahead (dynamic pressure). At faster flow, static pressure is less and 'flowing pressure' is correspondingly stronger.

That's why it's absolutely sure possibility will come up, where one molecule will not collide already at S but finally at T (tracks marked blue). Molecule O thus will not end at position P but for example at position U.

Slow flows let escape their molecules aside, while faster flows are less 'off-putting' at neighbouring sides. At the very end results (well known fact), slow 'flow-threads' are bended to faster flow-treads. Similar to previous evaporation, slow flow get lost of its fastest molecules resp. at least of molecules fitting best to faster flow, based on their actual speed and direction. This process results acceleration of fast flow by 'supplies' of slower flow.

Also resulting are movement's directions less 'bulky' of all involved molecules, i.e. accelerated flow in addition shows structure better coordinated. There are essentially more molecules in relative narrow compound moving into most likely directions. This flow thus affects very small static pressure (sideward) and essentially stronger flow-pressure (into direction ahead), based at its high density also above previous constancy of pressures (which is valid only if fluids are pressed through pipes, thus within closed system similar to steam-engines and reduced validity of Second Law of Thermodynamics). Now these well structured flows really show movement with inertia (thus moderating previous claims concerning inertia of gases).

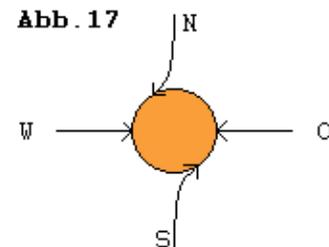
At vortices systems, speed increases from outside towards inside. Movement-systems like these are self-accelerating indeed, because molecules with their molecular movement-speed enter into faster flow on and on. Or - so no doubts about constancy of energies come up: gases of outer areas transfer their static pressure in favour of kinetic pressure of each areas more central. Besides evaporation and gravity-lift this effect is third motor for driving whirlwinds.

Bernoulli defined general formula long times ago. Here I only detailed explanations based on molecular movements (like already at my 'Fluid-Technology', at many other chapters of my website, e.g. lastly at mentioned chapter concerning Suction-Turbine, also by many different pictures). These known facts are reason for self-acceleration of vortices systems. Tropical whirlwinds show results of these processes all too clear. 'Phenomenal' only is obvious violation of 'law of increasing entropy' - however any evaporating drop of water violates that fictive conclusion.

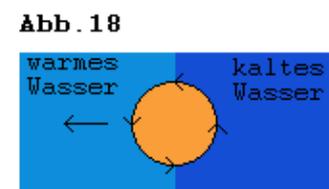
### How and why Whirlwinds rotate

If all surrounding air would move towards centre only in radial direction, no differences of speed at neighbouring flows would exist and previous motor could not work. Daudrich discusses reasons for rotation in details, so here at Abb.17 'Coriolis-Force' is to mention only in brief.

Air flows from north are drifting to west, because towards equator earth moves faster and faster below air. Opposite, air from south moves towards north-east. These flows don't hit frontal but left-turning motion comes up - at north-hemisphere, opposite at south-hemisphere.



Tropical whirlwinds are born by evaporation of sea waters (of at least 26 degrees Celsius). These vortices can come up direct at equator, adult whirlwinds however mostly appear from 5 degrees latitude. Direct at equator no Coriolis-Forces affect, i.e. there turning sense might start by chance. Afterwards however whirlwinds wander to north or south, depending on their turning sense.



### Whirlwind searching for Food

Daudrich describes several times analogy between whirlwinds and living beings: they got born and need food, they are 'searching' for food on and on and find right ways (otherways they die). At Abb.18 reason for that accurate wandering is sketched.

If whirlwind, by chance, comes into area relative humid and warm, evaporation will increase and thus also stronger upward motion of air. Spirally movements there become faster, so vortex will shift to that side - vortex-system walks to each area of best food automatically. Advantageous areas are these of shallow (warm) waters however also (humid) hot landscapes. At these areas comes up high evaporation and thus stronger lift. In addition, these high speeds result previous mentioned effect of acceleration by integration of neighbouring molecules.

Daudrich called border layer between water and air a filter, where by process of evaporation only these water molecules with actual strongest (accumulated by coincidence) kinetic energy are integrated into air. Just like this works border layer between slow and fast flows: normally 'slow' (resp. not-fitting) molecules are rejected by normal collision. Only molecules (coincidentally) fitting by speed and direction to faster flow are integrated and thus contribute to acceleration of faster flow - by input of their molecular speed.

Border layer between water and air is limited, however increases rapidly if storm churns up and spray of 'flying waters' come up. This is once more source of automatic self-acceleration of system because much more water masses evaporate.

Border layers between slow and faster air flows however exist within whole space of turning vortex, at any places slow and faster flows are neighbouring. That's why that 'Bernoulli-Effect' works within total system and is decisive for self-acceleration of vortices systems. At 'dry' tornados or whirlwinds this effect is single motor: molecular movement of surrounding area pushes these vortices as each fastest molecules contribute to most dense and well structured flow on and on.

### Dead Eye

If this supply no longer is available, vortex runs out and motion's system dies. 'Little death' suffers tropical whirlwinds at their eyes. Daudrich and many others argue with inertia and centrifugal forces when explaining situation within eye and its phenomenal 'wall' (see upside cam at Abb.11). My explanation is different.

At starting phase of tropical whirlwind at first comes up a 'warm air bubble', lifting upwards within surrounding air some colder. So air of environment flows radial towards that centre and a part of this air is 'sucked' upwards at border of warm air bubble. Resting part of this air flows below bubble, so at centre air becomes rather dense. Following air escapes this high pressure by moving upward at spiral tracks, where flow is bended upward nearby right angles (like shown at upside picture EV WKW 03 at G to M) and follows lifting bubble.

Into this fast upward flow, now from outside are integrated molecules of environment (like described at this picture right side), i.e. this upward stream extends into direction of that outer 'source of food'. At centre, there is no more 'food' resp. additional molecules can come only from upside and this air dropping down now builds centre of eye. Also this air immediately is sucked upward at border of eye. At this small layer come up small vortices, which Daudrich called 'roller-ball-bearings', as thin layer for balancing downward-motion within eye and following upward-motions at border of eye.

So at first (and later on) radial component of converging air masses press vortex together, at the other hand spiral upward movements at border of eye are growing outwards on and on, so lastly balanced status is achieved. At centre of eye air flows from upside downward, there is clear sky however there exists no high pressure, because this air again becomes integrated into fast upward motion at border of eye.

In this phase of 'grown-up' whirlwind, at centre no longer exists warm-air-bubble. Driving motor now is outside of centre, because from outside most masses of air can flow towards eye and this air becomes humid and light by evaporation. Now anywhere are flows of different speeds and at all these border layers works previous 'filter', i.e. process of transition of static pressure into kinetic energy takes place.

### **Sucking Eye**

At (tropical) whirlwind thus air from outside is sucked inward and static pressure of environment drives and accelerates system on and on. A 'trunk' coming out of centre of thunderstorm cloud however approves, also eye can affect like suction.

At thunderstorms exist many flows within air. By chance flows will meet from opposite directions or drift alongside each other by different speeds. Resulting off are inward rolling motions and 'clouds play merry-go-round'. Like described upside, these vortex systems extent towards outside resp. more and more outside regions become integrated.

However also centre of such clouds show suction effect. From upside is available few 'food', because air upside is thin and static pressure is relative low. From downside however, masses of air can flow into eye of this vortex with effect described upside. Resulting of this process is picture of funnel-shaped trunk, growing out of downward centre of that cloud.



Visible diameter of these vortex-trunks mostly are only small at bottom. Nevertheless trunk can show enormous forces, lifting upward heavy bodies, cars and even compact waters inclusive fishes are sucked in, falling down many kilometre aside. Indeed, suction by itself has no effect. It's only static pressure of environment which presses masses of air to centre by high speeds, and again, these strong storms change horizontal direction into vertical practically right angles.

### **Replication of Energy-Transmission**

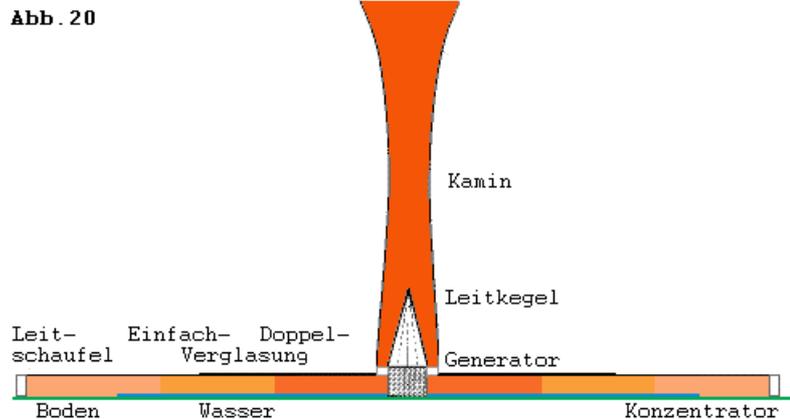
Enormous concentration of energies at these systems is well known. Daudrich proved this occurrence not at all is based only at sun radiations but clearly contradicts Second Law of Thermodynamics. Here appears no increasing entropy but extreme different structures are build up. At these processes are no 'losses' in shape of inferior heat. Opposite, huge differences appear and corresponding energies, even only temporary (while in total still constancy of all energies is valid).

Essential effects are based on potential-filter of evaporation, affecting gravity in shape of lifting forces and - last but not least - filter for transmission of static pressures into kinetic energy of fast flows - as I pointed out.

It might seem idle to argue about best explanations for phenomena. Without question it's possible to rebuild technically these processes of self-acceleration resp. energy-concentration and to use affecting forces. The better artificial rebuilds fit to essence of natural processes, the more effective these machines will work.

**Vortex-Powerstation**

Daudrich deduces adequate construction of vortex-powerstation from his findings and essential elements schematic are shown at Abb.20. Spectacular is high 'chimney' like characteristic sign of some real experiments too. Also at other upwind-powerstations chimneys are planed many hundred meters high. Daudrich however proves by calculations, this chimney will work with essentially less height (so this drawing is not true to scale).



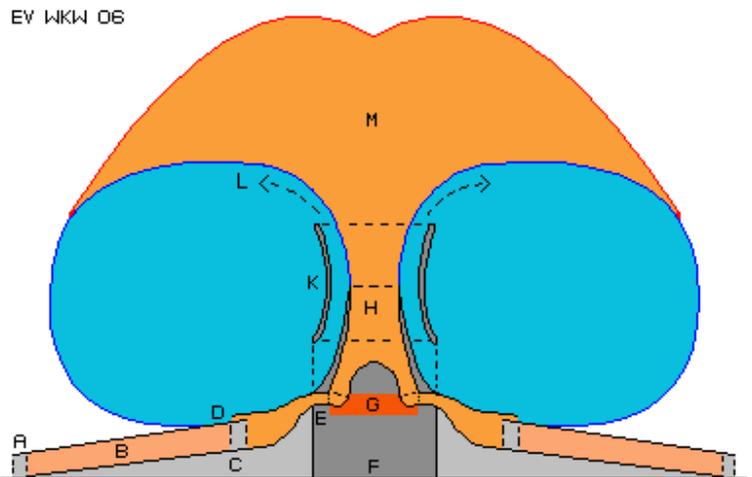
Into concentrator (of ten to some hundred meters diameter) air of environment flows, where fins (German Leitschaufeln) at border already initiate twist into turning sense of system. At ground (German Boden) are installed water-tanks (German Wasser) for evaporation. Daudrich describes these installations in detail, e.g. also how sea water is to desalinate and fresh water is produced (by condensation within chimney), so it's not necessary to repeat these aspects here. Important however is to mention, by these 'warm-water-tanks' system can work also at night and 'bad weather'.

As roof of concentrator outside will do single-glazing, further inside double-glazing is to install (German Einfach- / Doppel-Verglasung). Air thus becomes increasingly warm and humid (here marked by different red), flows into central generator and flows off alongside 'guiding-cone' (German Leitkegel) through chimney (German Kamin).

**Optimum Process of Flow**

At picture EV WKW 06 schematic are shown some suggestions for improvement, which by my understanding of fluid-behaviour will result better mass-throughput and efficiency. Also this drawing is not true to scale, in comparison to chimney that concentrator will show wider diameter.

Air of environment flows through fins (A) into concentrator (B), which at least towards centre should rise little bit. Also further inside, twisting motion of air should be controlled by fins (C). Just before generator (G) a nozzle (E) should be installed.



In theories, constancy of pressures is valid within flows. In spite of this it's well known at fluid-technology, a diffuser (wider cross-sectional surface) affects essential losses, while a nozzle generates faster flow without resistance. As walls become more and more narrow, molecules movements get 'total-mirrored', so flow becomes more stretched, more equalized and more dense.

So here upside and downside border-surfaces of concentrator should smoothly become narrow, thus air enters generator through ring-shaped slot (E) - with enormous speed and really with 'inertia-effect'.

Upside of generator, air can flow off through chimney (H). Real lifting forces however can only affect, if this warm and humid ('light') air is embedded within medium more heavy. If for example hot air is situated within closed cup, it can escape upward only because cold air at upper border falls into that cup. It's delusion to believe, within kilometre-high towers air would escape automatic (opposite, air within chimney is protected by walls versus side-pressures, i.e. can not be pressed upward). So tower may not be closed downside (like at previous example of cup), and an downside-open-tower must be less high.

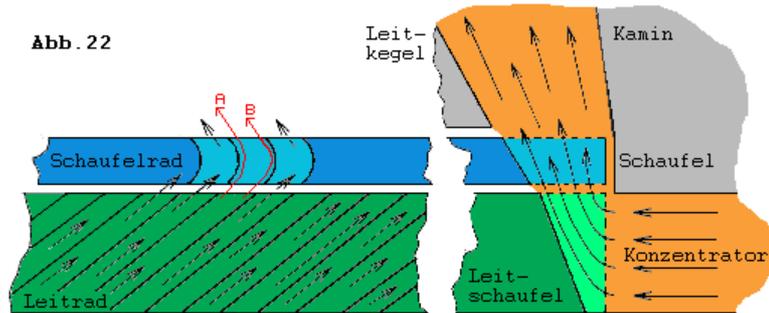
At central building (F, dark grey) upside of generator (G) is to build chimney (H), which towards upward can become less wide (so not like diffuser with its increasing diameter). Air vortex moving upward within chimney once more has to be accelerated, so directly behind generator really relative low pressure exists. Any vortex-system can be accelerated all times only by static pressure of environment.

That's why at central building is to install second 'chimney' (K), shell-shaped with some wider diameter than inner chimney (H) and reaching some higher and upside becoming wider. Between outer and inner chimney should be installed fins, which towards upside increasingly are bended (see below).

Only schematic here is sketched, air of environment (L, blue) around chimney will build ring-shaped 'ball-gear', which at its centre will really affect lift to waste-air (M, red). This roller of air shows flow-shape of ring-vortex (torus). Parts of that air well could be guided into concentrator (at D) and there are sucked-in without resistance (like at any water-jet-pump), resulting additional mass-throughput.

### Energy-Transmission

Decisive now is to transfer kinetic energy generated within that vortex-system into mechanical turning momentum at its best. Daudrich suggests a turbine, which essential elements schematic are sketched at Abb.22.



Air (red) flowing through concentrator towards centre is diverted towards upward and ahead (into turning sense of turbine) by fins (light green, German Leitschaufel), which are parts of stator (dark green, German Leitrad). Air flows between vanes (light blue, German Schaufeln) of turbine-rotor (dark blue, German Schaufelrad). Air then flows between central guiding-cone (grey, German Leitkegel) and chimney (grey, German Kamin) upwards off system.

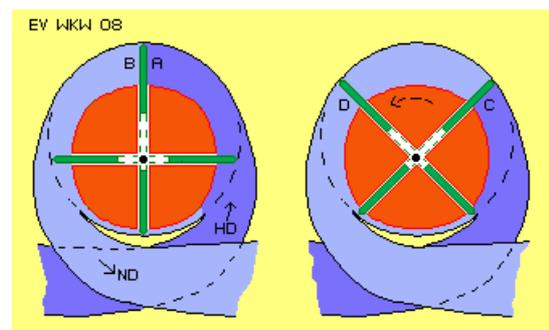
By diversion of flow at pressure-side of vanes (B) kinetic energy of flow is transformed into mechanic turning momentum. Real energy-transmission all times can only occur by pressure, i.e. as molecules of air collide with pressure-side of vanes.

At turbines of this construction, transfer of energy can not be complete, because parts of air fly through turbine without collision, as they move alongside 'suction-side' (A) of vanes. At any surface bended backward from direction of flow, area of relative voidness comes up, into which molecules fall, see spontaneous change of direction of flows at upside picture EV WKW 06 at M.

### Slide-Turbine

This negative effect is to avoid only by 'Free-Jet-Water-Turbines' and some other conceptions. One example schematic is shown at picture EV WKW 08.

Air flowing inward by high pressure (HD, dark blue, static or kinetic, German Hochdruck) hits onto pressure side (A) of a slide (green). At slide's backside (B) exists low pressure (ND, light blue, German Niedriger Druck), so total difference of pressures via slide is transferred into turning momentum of rotor (red). Also at following phases (C und D) this difference exists between a front- and a backside of slides.



At this conception, inlet- and outlet-areas must be shifted in axial direction, e.g. spiral arranged like here drawn schematic. Several of these modules could be installed one aside next at one shaft. Continuous mass throughput exists with practically constant turning momentum. That's why turbines with slid-plates thus are advantageous for small units or for usage of small pressure differences (e.g. also at previous mentioned 'Autonomous working Suction-Turbine'), even mechanics and sealing are not quite simple.

### Diversion

At whirlwind horizontal flow changes into upward direction at border of eye, mostly by 'suction' of already upward turning spiral vortex. At Daudrich's conception (previous Abb.22) this diversion is done by stationary fins (there 'Leitschaufel'). On the other hand, mechanical turning momentum is only to achieve by redirection of flows at movable constructional elements. Organisation of flow through turbine should be corresponding to that fact.

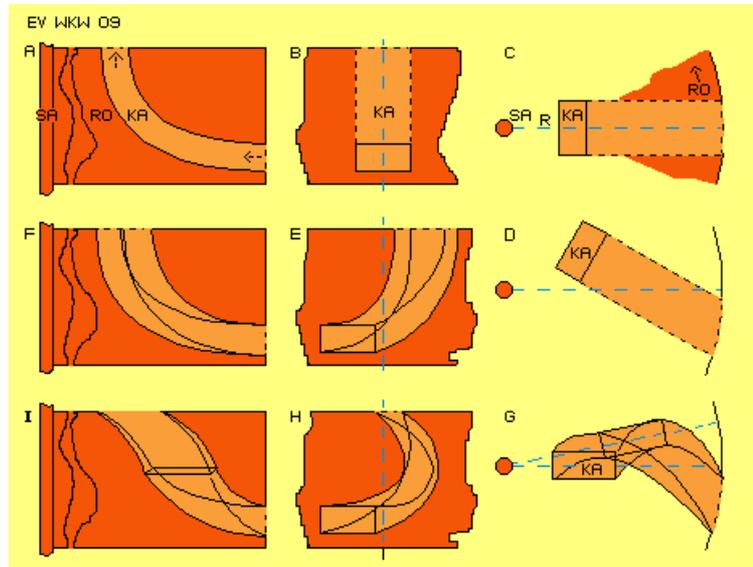
At picture EV WKW 09 schematic are shown segments of rotor (RO, dark red). Instead of vanes or plates here are drawn channels (KA, light red, German Kanal), arranged with some distance to system axis (SA). Flow is guided from outside to upper side of rotor.

At A is shown cross-sectional view through system axis. Redirection from horizontal to vertical flow is done within rotor. At B sight from outside radial onto circumference of rotor is shown, Redirection within channel occurs from inlet at jacket downside to outlet at upper surface of rotor. At C is shown view top-down onto rotor. Channel here is drawn in radial direction (blue dotted line).

Turning momentum by redirection is only to achieve, when channel is arranged diagonal to radius, e.g. like schematic shown at D. By view from outside (E) this channel runs inward and diagonal upward ahead (in turning sense of turbine). By schematic cross-sectional view (F) this channel appears twisted.

Maximum turning momentum is only to achieve, if redirection occurs right angles to radius. So channel should be bended resp. twisted some more, like sketched at bottom row of this picture.

By view top-down (G) channel shows diagonal ahead and is guided upward alongside a radius (upper dotted blue line), afterwards however further inside upward. Outlet thus is arranged radial (here drawn by right angles, really would show shape of circle-segment). Also view from outside (H) now shows twisted track of channel. By cross-sectional view (I) redirection now also at upper part appears twisted.



### Multiply Twist

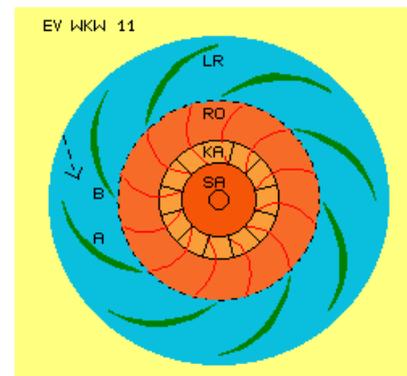
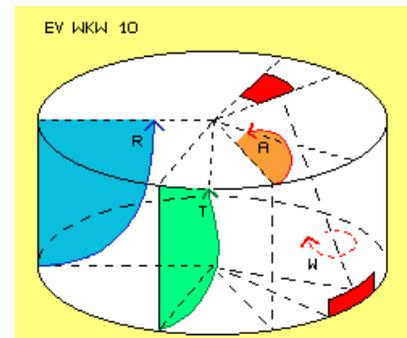
If flow within turbine is redirected from radial into axial direction, thus vanes (or here channels, i.e. space between two vanes) will show rather complex shape. At picture EV WKW 10 rotor is marked as round cylinder and diverse windings of longitudinal axis of channel are drawn. At first redirection (R) from radial into vertical direction is necessary. Longitudinal axis of channel shows second bending at tangential plane (T). Redirection third time is done by curve in axial level (A).

Cross-section of channel thereby becomes twisted (W, German Wendelung) and takes different shape (where however cross-sectional surface should not become smaller). This twisting could even be stronger than marked upside, so much off sides of channel one time would become pressure side (and air flowing alongside all walls would be redirected there).

Naturally these points of view are well known at turbine construction. However here are not to use common turbines, because here no static pressure exists at inlet (opposite to water-powerstations or steam-engines) but only kinetic energy of 'sensitive' air flows.

### Turbo-Motor

Flow within concentrator at centre is nearby tangential. If air can not escape upwards, this vortex will die within short time. Turbine represents certain resistance (otherwise no mechanical turning momentum could be drawn off). So short time before turbine, flow is to 'force' inward, like schematic shown at picture EV WKW 11.



This redirection can be done by fins of stator (LR, green, German Leitrad), where flow is pressed inward by pressure sides (A) of fins. This is done by rather few friction losses, if wall is bended rather smooth.

Acceleration however is to win by flow alongside 'suction-side' (B) of fins. Into this areas of less density, molecules fall with their molecular speed, so flow is accelerated (local up to maximum of sound speed). This

previous mentioned process is well know, e.g. at upper sides of wings (here described in details in many chapters, e.g. [Suction and / or Pressure](#)). This effect once more is essential driving motor of this system.

These fins should be installed in combination with nozzles shown at upside picture EV WKW 06 (within which also acceleration is achieved without friction losses). It would be advantageous, if nozzles inside would show little bit downward (like drawn at this picture), so direction of compact flow is to redirect even stronger (and only by redirection of flow mechanical turning momentum is to achieve).

Effect of acceleration by flows alongside backward bended surfaces (previous suction-areas) should also be used upside of turbine. Between chimney and central guiding-cone spokes are necessary (for static of building resp. for bearing turbine shaft). These spokes should be bended that kind, within chimney again will come up twisted flow. Like already mentioned at picture EV WKW 06, also between inner and outer chimney should be arranged fins, upwards stronger bended, so air of environment is accelerated into spiral upward motion (as 'roller-bearing' for output off chimney).

### Clean Energy-Supply

Dr. David Daudrich described processes of tropical whirlwinds at this book scientific exactly. He proved that and why these motion systems are not bound to limitation of common laws of thermodynamics. These systems don't consume energy, but temporary extreme concentrated energies are affecting.

Daudrich also did show these processes are to rebuild artificial and most effective vortex-powerstations can be constructed. Above production of electric current, these systems show advantages concerning fresh water supply and agriculture. These units are completely environment-friendly, even chimneys are relative low. These powerstations can be build immediately by known technologies, depending on demands with diameters from ten to several hundred meter. These systems do not work only by much sun radiation but everywhere evaporation can be organized.

With this workout I approved Daudrich's findings und I contributed some additional aspects and suggestions for improvements of efficiency of energy transmission.

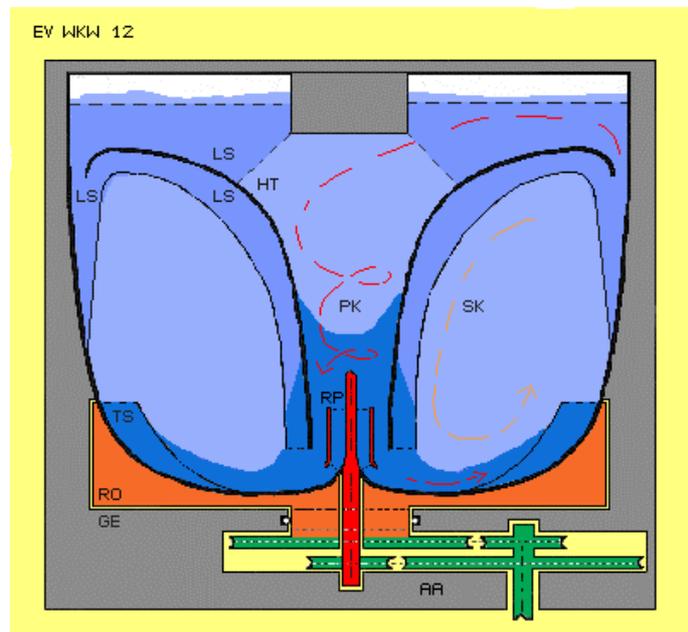
It's absolute grotesque how 'cool' mankind looks forward to inevitable run-out of gas and oil, even end of this wasteful period is not hundreds but only dozens of years ahead. Who can take responsibility not to use potential of vortex-powerstations immediately?

### Appendix Small Vortex-Powerstation

Years ago at Fluid-Technology I described [Rohrpumpenwirbler](#) which uses principle of vortex system by small scale. 'Rohrpumpenwirbler' means something like 'Pipe-Pump-Whirl'. Sorry, these inventions are available only in German, short descriptions in English are listed at starting page and sitemap quite downside. At the following this Rohrpumpenwirbler is described in brief.

Instead of evaporation and lift, starting momentum can also be produced by mechanical drive. Effect of self-acceleration works also in total 'dry' environment, as every small whirlwind approves. Also within small tanks, vortex systems can be build and previous effects be transferred into mechanic turning momentum. However it will be advantageous to use fluid more weighty, e.g. water or oil.

At picture EV WKW 12 conception is drawn as schematic example. Within round housing (GE, grey, German Gehäuse) upside and aside are installed fins (LS, German Leitschaufeln), which take stationary hyperbola shaped funnel (HT, hyperbelförmiger Trichter). Within downside narrow opening of funnel is installed a 'pipe-pump' (RP, dark red, German 'Rohrpumpe'). Downside within housing is installed rotor (RO, light red) with turbine vanes (TS, German Turbinenschaufeln). Pipe-pump and rotor are connected via gear (green), by which drive (at start) is done or usable power (AA, German An- und Abtrieb) at running mode is drawn off system. Shaft of pipe-pump is beard within hollow-shaft of rotor. Pipe-pump turns faster than rotor.



Whole space inside of tank is filled up with water. Water marked by light blue are areas of relative free motions. At areas marked middle blue water is guided by fins. At areas marked dark blue water is accelerated resp. energy transmission occurs.

When starting system, pipe-pump must rotate (where at version drawn here also rotor will rotate, however much slower). Pipe-pump is simple piece of pipe with e.g. two vanes inside. This pump moves water downwards, and water will flow alongside plate of rotor outward (and back upward).

Towards outside, turbine vanes rise of this rotor-plate, which are shaped as non symmetric teeth. Resulting are 'vanes without backside', i.e. total kinetic energy of water is transferred at pressure-sides into turning momentum (details see download of my Fluid-Technology in German part of website).

Pipe-pump must accelerate only small part of water downside of funnel, must serve only as 'trigger', building some 'vacuum', into which molecules of water within funnel will fall - with upside described effect of self-acceleration of this vortex system. Essentially stronger mass-throughput results, much stronger than energy input for this mechanical trigger. Marked primary circuit (PK, German Primär-Kreislauf) is supported by secondary circuit (SK, German Sekundär-Kreislauf), which practically is torus-shaped flow (analogue to function of environmental air at upside chimneys).

This system behaves in small scale corresponding to upside discussed vortex-powerstations. However here is used water as medium and vortex is organized into other direction, within funnel downward. Instead of evaporation, trigger-momentum for coming up vortex here is done by some 'mechanical help', as relative small pump produces area of relative void and twisting movement same time. Redirection of flows are very effective within that 'bowl' of rotor, where at relative long lever arms practically all molecules collide with pressure side of vanes. These vanes are hit by water accelerated by pipe-pump, additional water from vortex inside of funnel and also water of vortex at outside surface of funnel. So this machine will show surplus of usable energy, based on coordination of molecular movements.

By this short description and simple sketch, only principle of this machine is mentioned, which is to realize in many variations. By the way: this 'auxiliary motor' could also be used for starting large whirlwind-powerstations at 'bad-weather-situations'.

### Realize Alternatives, now

It's true, laws of thermodynamics truly describe processes at steam-engines. It's simply not true, thereby all processes in nature are defined comprehensively. Nature obviously uses some 'tricks', e.g. in shape of filters or catalysts or membranes to build structures resp. to decrease entropy. If these natural processes are rebuild in machines, limitation to hundred percent efficiency is not valid. Daudrichs theoretic findings concerning tropic whirlwinds (like my considerations and these of many other researchers) approve this without any doubt - and real whirlwinds demonstrate this convincingly.



It's today's exclusive job to search for and to tap and to realize these possibilities, beyond actual limitations of common science. Previous principles of low-cost and clean energy-supply are absolutely working, no matter by small scale, middle or large scale whirlwind-powerstations.

Vortex-powerstations are not bound only to hot landscapes. Driving motor of evaporation is also given at coasts and at rivers. Where now nuclear- or combustion-powerstations are situated (like at these pictures) energy is also to produce by 'greenhouses with chimneys', as economic like ecologic solutions (while common solutions of energy supply are nothing else than crime to the debit of planet and following generations).

Dr. David Daudrich asks politicians, scientists, engineers and industrialists by substantial arguments to realize these alternatives immediately. I'll state brutal fact: last century's generations of mankind were proud of technical progresses - and behaved like scum of the earth. Present generations have real chance to top it - if consequences are not drawn immediately.